A study of the organizational complexity of the offering of Basics Mathematics at a Namibian Tertiary Institution

by

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DECLARATIONS

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ABSTRACT

The main purpose and aim of the study was to assess the main determinants of performance in the teaching of Basic Mathematics at a Namibian tertiary institution from the positivist theoretical standpoint. The study sought to gauge the impact of organizational processes on organizational performance in the teaching of Basic Mathematics at the University of Namibia; to determine the link between lecturers' skills development and organizational performance in the teaching of Basic Mathematics at the University of Namibia; to assess the impact of organizational resources on organizational performance in the teaching of Basic Mathematics at the University of Namibia; and determine how the organizational processes and performance in the teaching of Basic Mathematics at the University of Namibia be improved. The researcher observed the rights, freedoms and liberties of the participants.

The study used a mixed research design through the use of closed and open ended questions. Self – administered structured questionnaires were administered personally to 55 randomly and purposively selected lectures for Basic Mathematics at a tertiary institution in Namibia. A Statistical Package for the Social Science analysis plan package SPSS Version 25 was used to analyze the data. The data analyzed was Ordinal because of the Linkert scale. Linkert scale was used because it measures the respondent's attitudes. Data was described through the use of descriptive statistics. Chi-square test was used to compare the dependence or relationship between variables. The validity was measured through triangulations and the reliability of the scale was measured using Cronbach's alpha value.

The study revealed that organizational processes and organizational resources are the main domains which seem to be contributing to the foregoing poor performances being experienced at the University of Namibia. It also unveiled that organizational commitment, skills development and organizational performance are sufficient at the University of Namibia and are not the ones that can be blamed for the poor performance being experienced in the mathematics department at the University of Namibia. Therefore, the study recommends that the Mathematics department at the University of Namibia should work with the Ministry of Basic Education, Arts and Culture to ensure a continuous flow of concepts from primary and secondary education to tertiary level. The University should invest more money in Mathematics department to have all the resources

required. More recruitment is needed in the Mathematics department. More staff (lecturer) training is needed for performance enhancement. The Ministry of Basic Education, Arts and Culture should review the high school mathematics curriculum to close the gap between high school and tertiary curriculum.

The study recommended that there is need to constantly pilot new ideas to improve our educational processes. In addition, the study recommended that lecturers need adequate exposure contemporary maths teaching methods. There is need for the lecturers to undergo career development within the Mathematics Department at the University of Namibia.

OPSOMMING

Die hoofdoel en oogmerk van hierdie ondersoek is die assessering van die bepalende faktore vir prestasie by die onderrig van Basiese Wiskunde aan ‘n Namibiese tersiêre instelling vanuit ‘n positivisties-teoretiese standpunt. Met die studie is die uitwerking van die verband tussen vaardigheidsonwikkeling van dosente en organisatoriese prestasie in die onderrig van Basiese Wiskunde aan die Universiteit van Namibië bepaal; die impak van organisatoriese hulpbronne op organisatoriese prestasie in die onderrig van Basiese Wiskunde aan die Universiteit van Namibië geassesseer; en daar is bepaal hoe die organisatoriese prosesse en prestasie in die onderrig van Basiese Wiskunde aan die Universiteit van Namibië verbeter kan word. Die navorser het die aansprake, regte en vryhede van die deelnemers deurentyd in ag geneem.

Tydens die ondersoek is ‘n verskeidenheid van navorsingsontwerpe toegepas deur die aanwending van geslote sowel as ope vraagstelling. Selftoegepaste, gestruktureerde vraelyste is persoonlik gelewer aan 55 lukrake sowel as doelbewusgekose dosente vir Basiese Wiskunde aan ‘n tersiêre instelling in Namibië. ‘n Statistiese programpakket vir die analisering van Sosiale Wetenskappe (Statistical Package for the Social Science), SPSS Version 25, is gebruik vir die ontleding van die data. Die geanaliseerde data was Oorspronklik vanweë die aanwending van die Linkert-skaal. Die Linkert-skaal is gebruik aangesien dit die respondent se houding en ingesteldheid ook meet. Data is beskryf deur die gebruik van deskriptiewe statistieke. Die Chi-vierkanttoets is gebruik in die vergelyking van die afhanklikheid tussen die veranderlikes. Die geldigheid is gemeet deur triangulasies en die betroubaarheid van die skaal is gemeet aan Cronbach se alfawaarde.

Voorts het die ondersoek aan die lig gebring dat organisatoriese prosesse en organisatoriese hulpbronne die hoofareas is wat blyk by te dra tot vorige swak prestasie by die Universiteit van Namibië. Na aanleiding van die studie is ook blootgelê dat die Universiteit van Namibië oor genoegsame organisatoriese toewyding, vaardigheidsontwikkeling en organisatoriese prestasie beskik en dat dít nie die oorsaak van swak prestasie by die instelling is nie. Na aanleiding van hierdie studie word dus aanbeveel dat die Wiskunde departement aan die Universiteit van Namibië met die Ministerie van Basiese Onderswys, Kuns en Kultuur sal saamwerk ten einde te verseker dat ‘n volgehoue vloei van konsepte vanuit primêre en sekondêre opvoeding tot op tersiêre vlak kan plaasvind. Die Universiteit behoort meer geld te belê in die Wiskunde departement. Meer

opleidingsgeleenthede vir doseerpersoneel is nodig ten einde prestasiebevordering te verseker. Die Ministerie van Basiese Onderwys, Kuns en Kultuur behoort wiskundeleerplanne vir hoërskole te hersien ten einde die gaping tussen tersiêre en hoërskoolkurrikula te oorbrug.

Voorts kan daar, na aanleiding van hierdie studie, gerapporteer word dat ‘n dringende behoefte bestaan vir die volgehoue loodsing van nuwe idees vir die verbetering van opvoedkundige prosesse. Die studie dui ook aan dat dosente deeglike blootstelling behoort te kry aan kontemporêre wiskunde-onderrigmetodes. ‘n Behoefte is geïdentifiseer vir voortdurende loopbaanontwikkeling van dosente aan die Wiskunde Departement, Universiteit van Namibië.

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LIST OF ABBREVIATION AND/OR ACRONYMS

MoEAC:	Ministry of Basic Education, Arts and Culture
SPSS:	Statistical Package for Social Science
UNAM:	University of Namibia
QCD:	Quality Control Department
TQM:	Total Quality Management
NSSC:	Namibia Secondary School Certificate
HODs:	Head of Departments
CHE:	Council for Higher Education
FET:	Fisher's Exact Test

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Chapter 1 INTRODUCTION

1.1 Introduction

This section puts the study into context by providing the background of the study, statement of the problem, research questions, and aim of the research. The chapter did not spare the significance of the study, delimitations of the study, definition of terms used in the study and outline of the study.

1.2 Background

In a dispensation of the knowledge economy dubbed as the Information Age, stress has been placed on practical, relevant and useful knowledge scientifically, economically and technically. At the heart of this relevant education is Mathematics which occupies pride of place as a panacea to most contemporary problems underlying the modern society. It is uncontested that Mathematics forms the basis of the drive towards civilisation, technological, scientific and industrial research and advancement. It is one of the subjects that have a direct relationship with other subjects, predominantly technical and sciences. According to Umameh (2011:71), Mathematics is a backbone and essential instrument for social, technical, information technology and commercial development of every state. It is a basic skill for every person in life. Without Mathematics, life and civilisation will come to a stand still. In connotation to the above, (Salman, et al., 2010:35) viewed mathematics as, A mirror of civilization because of its multidimensional values. It is the root that supports and sustains our daily lives. In another related study, Davis and Hersh (2012), described mathematics as, “An important subject that prepares students for the future irrespective of their career choices, and not only for academic qualification achievements”. It enhances critical thinking and practical reasoning which requires creative thinking and deep thoughts which however, human life cannot function without. In light of the above, it is imperative to note that the achievement of most educational goals , aims and visions hinge on the mastery of Mathematics as a subject or disclpine.

In equal measure, it stands to reason that most of the multifaceted systems and organizations in the contemporary world can only be explicitly understood with reference to Mathematics as much of the strategies and mechanisms of advanced technological systems are influenced by the mathematical inputs and outputs (Smith, 2004). Most governments have embraced and valued the significance of mathematics as emphases are placed on evaluating the performance in mathematics

in schools. Namibia is no exception to this as there is an interesting narrative of the significance of mathematics from the standpoints of mathematicians and national educational authorities. What is a major concern for many is the challenges Namibia is experiencing due to the decrease in mathematics enrolments in university mathematics department. This is compounded by inadequate performance among those that are enrolled especially at the University of Namibia. According to Miranda and Gideon (2011:4), first year mathematics students' poor performance at the University of Namibia has been on the rise for the past ten years. Furthermore, Miranda, et al.,(2013) states that, first year mathematics students' pass rates are extremely low and continually below average (50 percent). In this light the generality of the students are not at liberty or are reluctant to handle the mathematics context in this module, hence they move to the subsequent year with first year modules pending (Miranda,Gideon and Mugochi, 2013). Some students later change field of studies to departments where mathematics is not offered in an attempt to avoid this perceived stumbling block of advancement(Miranda, et al., 2013). Apropos of the above, it stands true to reason that Mathematics proves daunting and is a nigthmare to many students and this translates into inadequate organizational performance in the Mathematics departments at the Namibian tertiary institutions.

While several studies have committed to investigate the determinants of performance in educational institutions, this domain of Mathematics in the Namibian tertiary level context has been totally shunned and ignored; hence this vacuum fuelled the keen interest of this researcher. Against this nuanced background, this study investigated on the main determinants of performance in Mathematics in the Mathematics department at the University of Namibia by assessing the Organizational Complexity of the offering of Mathematics education at the University of Namibia.

1.3 Statement of the Problem

Prior to independence in 1990, the *'Bantu education'* system was in place in all non-white schools Tjikuua (2000: 1). This type of education did not emphasize Mathematics and Science subjects. According to Tjikuua (2000: 1), science field specifically mathematics and science subjects were perceived and primarily spared for whites even though they formed a small percentage of the population. They were perceived to be capable and competent to do science over the other race. However, the 'bantu education' system in Namibia fostered on basic literacy skills in the mother

tongue and a utilitarian knowledge of Afrikaans and English. The school syllabus for black pupils put emphasis on manual training, tribal heritage, agriculture, religion, elementary arithmetic and hygiene (Tjikuua, 2000). To date, Mathematics education in Namibia has not fully recovered from some of these colonial malpractices. Recognizing the seriousness of the problem and in an effort to improve performance in Mathematics at tertiary level, the University of Namibia embarked on an academic development programme called "*Science Foundation Programme*". The Science Foundation Programme is a bridging course aimed at strengthening skills and understanding of former Grade 12 learners in English, Physics, Biology, Chemistry and Mathematics. Mathematics is a compulsory module and a pre-requisite for all courses in the faculty of science in Namibia. Poor performance in mathematics by students is seemingly to be an issue of concern universally (Salman, et al., 2010:97). Githua (2013:75) stated that, "Despite the importance of mathematics in our daily lives and working environment, mathematics pass rates have been poor internationally and in Kenya." A similar situation was observed in Botswana since 1977. This prompted the establishment of the Pre- Entry Science Course (PESC) at the University of Botswana (Mabila, et al., 2006). Mathematics bridging courses have been part of higher education institutions for a while (Gordon, et al., 2010). According to MacGillivray (2009), Mathematics bridging offers prospective students a chance to acquire prerequisite knowledge in mathematics before enrolling for a degree programme. In addition, Gordon (2010) chronicled challenges that students in all junior mathematics subjects at university as are student diversity in mathematics background, motivation, conception of mathematics and approaches to learning mathematics. Upon completion of the bridging course, students are expected to have a better mathematical understanding, change in attitude towards mathematics and a strong confidence in doing mathematics. The goal of Foundation Programmes is to increase the enrollment numbers of students and production of competent science and technology graduates for Namibia's growing economy.

Irrespective of these concerted efforts above, performance still needs considerable improvement in the Department of Mathematics at the University of Namibia. The effectiveness of any education system depends on committed instructors with sustained skills development, adequate administrative support and appropriate infrastructure, teaching material, and adequate curricula. In their study, Bandele and Faremi (2012:8) found that, mathematics teachers and instructors faced challenges which included unstable policies, lack of standardised workshop practical work, lack

of in- service training, outdated equipment and lack of related modern instructional material. In substantiation of the above, it was observed that while several scholars have identified the main determinants of organizational performance to be organizational processes (Dumas et al., 2013:15), employee skills development (Jehanzeb & Bashir, 2013:249), organizational resources (Ombaka et al., 2015:25), and employees' commitment to the organization (Kashefi et al., 2013), there is still a lack of first hand practical research in this area in the Namibian institutions of higher learning perspective . Consequently, the implication of this in the Namibian tertiary education context is that, the existent link that is supposed to be there is merely assumed than proven empirically. Therefore, a literature review in this regards revealed a research gap that the researcher found interesting to explorer and address the following question: what is the impact of organizational processes, lecturers' skills development, organizational resources, and lecturers' organizational commitment on organizational performance in the Department Of Mathematics at the University of Namibia? Therefore, this research aims at filling the gap in addressing the above research questions.

1.4. Research Questions

The study answered the following sub-research questions:

What is the impact of organizational processes on organizational performance in the teaching of Basic Mathematics at the University of Namibia?

In what way do lecturers' skills developments impact on the organizational performance in the teaching of Basic Mathematics at the University of Namibia?

What is the impact of organizational commitment on organizational performance in the teaching of Basic Mathematics at the University of Namibia?

What is the impact of organizational resources on organizational performance in the teaching of Basic Mathematics at the University of Namibia?

How can the organizational processes and performance in the teaching of Basic Mathematics at the University of Namibia be improved?

By answering these questions, the aim of the study as presented below can be accomplished

1.5 Rationale for the Research

The research study seeks to assess the main determinants of performance in the teaching of Basic Mathematics at the University of Namibia. This will serve as a guiding instrument for the development of enhanced policies and programmes with regards to teaching mathematics in the Namibian tertiary institutions.

1.6 Significance of the study

The study is pivotal to the educational policy makers and the University of Namibia management. It will help the educational policy makers especially the Ministry of Basic Education Arts and Culture to develop better mathematics curriculum which will prepare students for tertiary level.

1.7 Delimitation of the study

This study is confined and restricted only to the University of Namibia lecturers for Basic mathematics module MAT 3511 across all the seven Namibian campuses.

1.8 Definition of Terms:

Organization: It is group of persons with a shared purpose that collaborates to carry out outlined tasks to accomplish pre-set goals and objectives in an organization (Neal & McClure, 2003). In an education concept, it is the way an educational system operates in providing educational services.

Performance: The ability to achieve a set of academic goals and objectives in Mathematics.

Basic mathematics: This is a semester mathematics module at the University of Namibia which is done at the onset of the BSc degree

Complexity: the state or quality of being intricated or complicated or lacking simplicity

1.9 Outline of the study

Chapter 1: Introduction

This thesis is made of five chapters. In the first chapter the study will be justified through giving its background and statement of the problem, providing the direction in the form of purpose of the

study, questions, objectives and definitions. Finally, the research delimitations and limitations structure of the thesis will conclude.

Chapter 2: Literature Review

This section will inform the theoretical framework underpinning this study, discuss prior literature related to the phenomena under study, expose the knowledge gaps and offer critical questions which further justify the existence of this study. It will also delve in greater detail on the concept of organisational performance.

Chapter 3: Research Methodology

In this section, details about the research design and methodology, population and sampling, research ethics, research design, data gathering instruments and data analysis processes are given.

Chapter 4: Presentation and Discussion of the results

This chapter presents the findings of the study which are discovered through the questionnaire. It gives meanings to the discoveries by demonstrate it with tables, charts and graphs. The chapter further discusses the outcomes of each of the main determinants of performance at the University of Namibia. Lastly, this chapter presents the strategies that can be used to improve the organizational processes and performance in the teaching of Basic Mathematics at the University of Namibia.

Chapter 5: Conclusion and Recommendation

This section outlines the summary of the chapters in the study. It further presents the findings, conclusions and recommendations of the study. The chapter also highlights the research limitations and presents possible future research studies based on the main findings of the study.

1.10 Summary

This chapter detailed at the background and statement of the problem, the purpose of the study and objectives of the study. The problem identified in the statement of the problem is poor performance of first year Basic mathematics at the University of Namibia. The significance of the study is discussed in this chapter, which indicates that the study will help educational policy makers and the University of Namibia management, identify factors that cause poor performance in mathematics. This study aims at assessing the main determinants of performance in the mathematics department at the University of Namibia.

The next chapter focuses on the literature related to the main determinants of performance in the mathematics department at the University of Namibia.

Chapter 2 LITERATURE REVIEW

2.1 Introduction

In this chapter the ideological framework upon which the study is hinged, the knowledge gaps, related literature and prior studies on organisational performance are explained. The major components and ideas in line with organizations such as organizational processes, skills development, organizational resources, and employee organizational commitment and organizational performance are discussed.

2.2 Theoretical Framework

According to Kane and Brun (2001:23), a theory is an organized, testable set of concepts, which attempts to explain or predict a social phenomenon. It is the lens with which one views reality, the position in relation to the study, the methodology and strategies for presenting and analysing the data. In other words a theory informs the what, who, why and how aspects of a research. In this parlance, the research was informed by a positivism theory which advocates that only observable, objective, provable and hard facts count. According to Kane and Brun (2001:15), Positivism is based on the assumption that reality exists: it is out there, hence the researcher can find out the way things are, what is really happening if the right questions are posed. From this theoretical point of view, the relationship between the researcher and nature is dualistic and the researcher did not need to be part of nature but stand apart and observe it objectively. To support the above, Kane and Brun (2001:15) articulated that, from a positivist school of thought, the world is stable, consistent, and predictable. Therefore, the researcher can single out and examine the relationships between variables or separate aspects of reality. The examination is done through statistical analysis and because measurement is standardized hence, such a questionnaires. In other words, it allowed the researcher to spend much time and effort in developing the instrument (questionnaires) which are carefully thought out to make sure they address the variables that concerned the study. According to Chiromo (2006:37), if the research can identify laws of cause and effect and the conditions under which they apply, we can explain past events and predict future ones provided, of course, that our explanation is correct and the conditions are the same. The study will have great breadth and given that reality is absolute and nature is orderly, the findings will be true anywhere

in which the circumstances exist. In light of the above, the findings will have high internal validity but not high external validity (valid in other settings) which can be problematic.

Brun and Kane (2001:16) postulated that, the research techniques used in the positivist approach are usually, but not always, quantitative because the variables are clearly defined, can be measured and the results can be converted to numbers. This study seeks to widen the knowledge in the area of science education by advancing and analysing a model which hypothesizes organizational processes, lecturers' skills development, organizational resources, and lecturers' commitment to the organization as determinants of organizational performance in the Mathematics department at the University of Namibia. With the benefit of hindsight, for the current study, this theory was applied to measure customers' level of satisfaction under the following domains: Organizational processes, Skills and Development, Organizational Resources, Organizational Commitment and Organizational performance. In this study, organization refers to the University of Namibia management, employees in the Department of Mathematics, HODs and all lecturers who are involved in the teaching of mathematics or who are teaching basic mathematics or have taught Basic Mathematics before.

In any educational institution, the educational management needs to be on the watch out for shortfalls in customer satisfaction and those factors that inhibit the productivity capacity of the institution. In this regard, the University should have measures in place to assess the way it impacts on its customers who are the students, their challenges and all the factors that constrain progressive learning such as incompetent lectures, content set up, high school curriculum linkages and material and resource availability.

Furthermore, the University or tertiary institutions should have means in place to improve on their delivery of quality service and this is done through the input of the Quality Control Department (QCD) of the University.

2.3 Prior Studies Conducted

There was a study conducted by Katanga and Ndudzo (2015) whose focal point was investigating the disparities in performance in Mathematics between boarding and non-boarding schools. This study established that boarding students outperformed the non- boards and this researcher strongly

felt that the findings were too obvious considering the financial, social and resource standing of the boarders. The availability of teachers after hours, study groups, a conducive study environment , educational level of the parents and rest time among others are part of the benefits of boarding and it placed such students at an advantage in Mathematics over the non- boards. The researcher felt that the study was simply interesting in unearthing the factors behind the differences in performances but the end result easily determined. In the same token, another study was conducted in South Africa by The South Africa Institute of Physics and Council for Higher Education (CHE) spearheaded by Nkosi (2013) on the unpreparedness of first year University Mathematics students and it unearthed that learners perform poorly at University level due to lack of thorough preparation in Mathematics at the Matric level. Taking both studies into consideration, the researcher discovered that the studies were basically about learner performance in Mathematics with attention being given on the learners themselves while little or nothing was touched on in term of the organisation or institutional structures. Furthermore, the studies impressed on the researcher that the prior researcher were hell-bent on discovering problems occurring at the lower levels of education in Mathematics yet the University had very little to do about on those problems. In as much as the studies unearthed some of the causes of poor performance in Mathematics, they lacked an in-depth analysis of the causes because they touched on a whole bunch of what may be held accountable. Indeed the issue of poor performance in Mathematics is a thorny one across all the levels of education but the prior studies did not investigate adequately on what roles, responsibilities and obligations do the universities hold in order to remedy the inconsistencies and sad situation at hand. It is in this light that the researcher felt obliged to tackle the problem head-on form the side of the organization (university) in a manner that would bring recommendations and solutions.

2.4 Organizational Processes

Organizational processes are defined as measured set of ideas and activities that together – and only together can transform inputs into outputs (Dumas et al.,2013:45). In the case of the Department of Mathematics at the University of Namibia, this includes administrative support, the teaching methods and curriculum, the assessment methods, resource allocation, decision-making, as well as rules and procedures. In contemporary organizations, organizational processes have

become one of the most important - if not the most important - management paradigm (Jenabati, 2015). By providing adequate information flow – both vertically and horizontally, organizational processes are a vital element in ensuring that an organization's goals are effectively achieved (Dumas et al., 2013:4). Furthermore, a number of scholars visualize the performance of an organization through the inefficiency of processes. Although the effectiveness of organizational processes is constantly associated with improved organizational performance, few studies have empirically investigated that relationship. The study by Jenabati et al. (2014:119) which was aimed at, "Exploring the correlation between effective organizational processes and improved organizational performance found that processes are essential in fostering an environment of reduced conflict and increased connectedness in an organization, thereby enhancing organizational performance." A surprisingly strong association was revealed by the findings of their study between organizational processes and overall performance. Bearing in mind all the dynamics that can possibly affect organizational performance, these findings are compelling (Jenabati et al., 2014:120). Moreover, the study of Dumas et al (2013:15) underscored a positive link between organizational processes and organizational outcomes.

On the other hand, recent experiences have shown that – subject to the prevailing balance between an organization's environment and its organizational structure, the management of organizational processes is yielding varying success. Expressed differently, this means that it is not true that process transformation results in improved performance. Several organizations have discovered that sometimes even intense levels of process enhancement do not always lead to enhanced organizational performance Jasimah et al. (2013:1154). All the above-mentioned underline the need to consider organizational processes as one of the important determinants of effective organizational performance.

According to Stalder (2017:56), "Processes are all small things or jobs of different types an organization does every day, over a period of years that eventually predicts and define how an organization will perform over time. It is very important that every member of an organization understands the company processes well as employment essentials and how they affects performance." In sync with the above, a conducive working environment enhances efficiency, effectiveness, productivity, motivation and employee commitment provided that the management

satisfies the employees' needs (Raziq & Maulabakhsh, 2003:12). A good work atmosphere leads to more success of the organization. Organizational processes need to be communicated to all the organizational members so that they are aware of their responsibility in the organization. Well implemented organizational processes create a favourable working environment if all members of the organization are well acquainted with their responsibilities (Bakar & Ahmad, 2010). The opposite will result in confusion, lack of interest and motivation, loss of efficiency and effectiveness. When lecturers are well acquainted with standardized procedures and policies of an organization they strive for the best to ensure efficiency, quality delivery, efficacy and effectiveness. They need to be consulted, engaged to be part of planning and decision making (Alan, 2014).

Moreover, every organization or department has policies and procedures that need to be publicised and provided to all existing and new lecturers (Bandele & Faremi, 2012). They should be clear and well explained to be understood and implemented in the same way by employees. Policies need to be communicated to all staff members of the organisation so that they are aware of their responsibilities and roles (Dumas, et al., 2013). The University needs to make sure that all such documents are available to all the members and they must not be exposed when an organisational member has done something that is not in line with the policy.

Management should provide administrative support to teaching and learning (Ahangar, 2011). There should be a constant piloting of new ideas to improve the educational processes. In an on-going comparative study by Miranda et al. (2013), the Namibian mathematics high school curriculum was compared up to with two African countries high school curriculum namely South Africa and Zimbabwe and one developed country, Alberta – Canada and it was found that there are many similarities in the subject matter but the depth of coverage of contents differs. The Namibian curricula's themes and topics are covered at a shallow depth compared to South Africa, Zimbabwe and Canada. In a similar study by Miranda et al. (2013) in determining the areas where students are performing poorly in mathematics at the University of Namibia, it was discovered that, the majority of students have weaknesses in comprehending mathematics concepts and themes for instance, inequalities, polynomials, functions, sets, sequences, partial fractions and absolute value in Basic mathematics.

Moreover, Miranda et al. (2013;10) unearthed that, the Namibian school mathematics curriculum (National Secondary School Certificate – NSSC) does not prepare learners with necessary basic mathematics skills for year one university mathematics students' as most content that is supposed to be taught is not covered in the (NSSC – curriculum) (MINISTRY OF EDUCATION,2007,2010). This can be one of the contributing factors to poor performance in mathematics at the University of Namibia." In light of the above, the prior studies serve to confirm the difficulty with which Mathematics is experienced in Namibian tertiary institutions hence the genesis of this study.

2.5 Skills Development

The life and viability of an organisation depend upon training, aptitude, and skills development of human resource as they are the key asset in driving businesses forward. Continuous staff training enhances skill development (Hamid, 2016). In the higher education sector, lecturers are the driving force of performance in tertiary institutions. Therefore, they should continuously receive necessary training to perform in their job. Lecturers' confidence should be enhanced to be competent enough to uplift the standards of the institution to be a strong competitor within the industry. Similarly, Niazi (2011) points out that due to pressure, business environments have caused organizations to become 'Learning Organizations' which adjusts and innovates in order to keep abreast of the technological trends and to be ahead of their competitors. Training should be considered as an essential component of every organization to ensure effective organizational management (Obi - Anike & Ekwe, 2014).

Obi - Anike and Ekwe (2014:20) further argued that, on job training is designed and intended to widen the knowledge, greater confidence and higher degree of performance. Staff development equips people with required knowledge to perform their duties or improve their skills for growth. To develop staff helps improve organizational effectiveness, increase individual and organizational competences, and close the gaps.

Skills development defines the systematic planned programmes that are aimed at improving employees' aptitudes, attitudes and behaviours through informative learning events and instruction which empower them by acquiring necessary skills and knowledge which will makes them competent personnel who can execute their work efficiently (Jehanzeb & Bashir, 2013). Many

lecturers may lack the ability to engage in continuous reflective practice to solve emerging teaching problems due to a lack of sustained skills development opportunities. According to Hameed and Waheed (2011), skills development is primarily concerned with the development of people's expertise and knowledge. What is interesting is the planned characteristic of the process which is underlined with regards to attitude modification, knowledge improvement, and skill or behaviour adjustment through learning involvements for the achievement of enhanced performance. Through the process of skills development, employees acquire new - and enhance their existing - skills, practises and approaches which help them to establish and maintain their jobs. Skills development has also been defined as a situation where an expert works with a learner to transfer to them a certain area of knowledge and skills in order to improve the current job.

Supporting the above, skills development is also viewed as planned programmes by an organization which enables employees to learn and acquire job-related competencies (Hameed & Waheed, 2011).

In light of the above, despite the experience one has accrued in a certain organization, sustained skills development can be a vital factor for the enhancement of employee's effectiveness (Jehanzeb & Bashir, 2013). Hameed and Waheed, (2011) postulated that, the focus of several programme of employee skills development is novel skills, methods, and notions that may have been unknown or unavailable at the time of initial recruitment. However, effective programme in this regard need to not only focus on job-related skills but also emotional reinforcement to handle wide-ranging circumstances. In a nutshell, this should emphasize self-esteem, self-efficacy, confidence-building and the desire for self-actualisation which can be beneficial in all aspects of one's professional life. In this parlance, it has been demonstrated that organizations which invest adequately in programs of employee skills development enjoy improved organizational performance (Jehanzeb & Bashir, 2013; Hameed & Waheed, 2011).

Development and training are essential (Weber, 2015). Most employees' interest is to perform in their jobs for self-advancement and the company's. Employees who do not get sufficient training or no training at all may be unable to perform to the best of their abilities and deliver because they do understand how to carry out their jobs. Incompetency will cost an organization a fortune due to negligence and errors which may prevent an organization achieve it is goals and grow. In an

education context, lecturers must be well experienced and knowledgeable in their subject content to deliver and produce good results. Inexperienced and incompetent lectures will fail to explain concepts well to students which will result in poor performance. University management must establish capacity building and career development programmes, to support and empower staff. Lack of training may lead to low self-esteem and confidence amongst employees, which will cause high employee turnover. High employee turnover is a bad reputation for the company which results in being unattractive to potential job candidates. No employee would like to be associated with the organization that doesn't keep employees for a long time and does not perform. Human resource is one of the key entities every organization needs to operate and succeed. Lecturers are the back bone of higher learning institutions whilst students are the clients or customers that must be rendered the best service. Any institution of higher learning with poor educational performance or poor social expectation is likely to close its doors due to low intake as a result of competitive environment.

Training and development increase and improve employee motivation, engagement and speed to competency (Ismail, 2012). According to Qureshi (2016), training is beneficial to both employers and employees of an organization for development and suceess. Training and development have plenty of benefits such as: increase consistency, production and job satisfaction; reduce supervision and errors; reduce employees turnover and absenteeism; discover and nurture employees talents and potentials and improve employees weakness and creates strong team building (Qureshi, 2016). Thus, continuous training and development empowers employees with knowledge and experience which helps them carry out their day to day activities with ease. Regular training may equip lecturers with vast skills and knowledge to complete tasks at a reasonable time. Competent lecturers can complete and produce masses of quality work with little waste on resources and time (Ismail, 2012). A knowleadgeable workforce improves efficiency. Thus, organizations need to invest in improving employees knowlegdge and skills to increase productivity and efficiency.

Job satisfaction refers to the feeling of fulfilment an employee has towards their job (Robbins, 2003). If employees are interested and passionate about their job then it implies that there is job satisfaction while negative feelings imply job disatisfaction (Armstrong, 2006). Job satisfaction

enhances motivation because there are no stressing issues which distract employees' attention from accomplishing the work and excel. Every employee deserves to be treated with respect and develop a sense of belonging in an organization. A strong sense of belonging motivates employees to give the best service they can. University management need to ensure that employees needs are met to remain devoted and loyal to the organization. The only way lecturers can greatly reward their institutions is by producing good results. This will be ensured if the following are in place: good working environment, better renumeration package, availability of staff development opportunities, fair work load distribution and adequate resources. The more motivated lectures are the more productive they become. Due to the competitive world we are living in, it is necessary to train employees regularly to remain competent and well advanced so they can compete with institution in the same domain.

Training builds up confidence and empowers employees with necessary skills to accomplish tasks (Ismail, 2012). Well experienced and competent lecturers will be well conversant with the job and will need less supervision. Lecturers need adequate exposure to contemporary mathematics teaching methods to confidentially facilitate the construction of knowledge to students in a bid to enhance their performance.

Training helps discover employees' talents. Lecturers must be offered opportunities to attend, facilitate workshops and cross train to unlock their potentials and uncover talents in their disciplines. Skills can be transferred through understudy programme to help fill the gaps when an experienced employee resigns or gets promoted. Career development opportunities must be available to everyone for skills development and satisfaction. Skills development enables employees to execute plans successfully.

2.6 Organizational Resources

Human capital is an important asset for organizations. According to Ombaka et al (2015), organizational resources have a great influence on the organizational performance. An organization cannot operate efficiently without resources be it physical or non-physical. Assets such as machinery, land, processes, knowledge and skills are resources that an organization needs to continuously operate. Inadequate teaching and learning resources can be a challenge in learning institutions. The cost of buying these teaching and learning materials is often very high. In this

regard, organizational resource can be physical and non-physical assets. Tangible resources (physical) and financial assets consist of land, furniture, capital and machinery while intangible resources include knowledge, skills, processes, brand name, organizations reputation as well as employees experience, alluded (Jugdev & Mathur, 2012). It therefore goes without saying that intangible resources have a broader and wider impact on the effectiveness, efficiency and performance of an organization compared to tangible resources.

The same sentiment was also echoed by Ahangar (2011) who proposed that physical assets are weak competitive assets as they can easily be copied or replicated by other competitors in the market in comparison to non- physical assets. Implied in the above is that, organizations serves as source of financial, informational, physical, technological and material resources and at the same time the tool for reconciling and blending those resource much to the organization's performance to come together as one part of the institution to work together to accomplish goals and objectives. This then calls for articulate leadership to pull these in the same direction hence managers need to source and manage organizational resources to accomplish goals.

Therefore, Universities need to invest in their lecturers' professional and personal development. Employees are the most important resource for any company that it uses to accomplish goals. Every organization need well trained and skilled personnel with diverse experiences. Organizations need adequate tools for operations.

2.7 Organizational Commitment

Needless to say an organizational success depends greatly on the willingness of the human resources to accomplish the purpose to which the organization is in existence hence devotion and commitment matter the most. Implied in the above is the indubitable fact that for organizational goals, aims and visions to be accomplished the equation is incomplete without the commitment of the lecturers.

Considering that teaching is an equally daunting and taxing profession, it makes it imperative to note that the success of the organization hinges on the human resource. No amount of force, coercion, threats, intimidation and spying can make people pull in the direction of the organization if they do not feel the need to do so (Musaazi, 1982). By its very nature, every organization has a

mission, vision and aims, that is a purpose and it takes communication to make this purpose known and after that the success of the institution mainly relies on commitment of the employees to the cause of the organization. Teaching in is a very demanding and sometimes stressful job and this may result in reduced commitment to the organization (Musaazi, 1982). Putti, Aryee and Liang (1989) stated that, employees emotional attachment to the organization has a significant impact on work-relevant behaviors such as performance and absenteeism.

Furthermore, Steinhaus and Perry (1996) stated that, dedicated employees remain proud and devoted members of an organization who share the same ideology as the organization of common goals and values which will ensure performance and productivity. These employees are likely to be inspired and become highly committed when there is a bond between the organization and their work. Committed employees are less likely to be absent and to resign (Allen & Meyer, 1990; Bishop, Goldsby, & Neck, 2002; Loi, Hang-Yue, & Foley, 2006). Every organization's wish is to hire employees who are likely to stick around, motivated and proactive about their careers and serious about success. Lecturers would commit and perform any given task in line of duty if their personal goals may harmonize with those of the university. Over-workload compromises commitment. Student - lecturer ratio is one of the determinant factors of performance and commitment in educational institutions. Employees who are highly motivate remains committed and well-focused workforce which strives to be productive and excel regardless of the working environment (Scholl, 1981).

To enhance organizational commitment, it's very important that lecturers' and university's values are similar (Ismail, 2012). This motivates lecturers to put in extra effort to help their department and the university as a whole to be successful. Employees' willingness to contribute to the organizational goals can be referred to as organizational commitment (Ismail, 2012). Employees need to be assured of their own growth within the organization. When the university meet it's employees expectations, they get satisfied and committed to their jobs. Satisfied employees remain committed to their jobs. When lecturers develop good feelings towards their job they can speak highly of the organization to their friends. Job satisfaction may lead to organizational commitment which will establish a positive feeling of belonging.

Committed employees remain loyal to the organization, share the same values and goals of the organization (Mowday, Porter & Steers, 1982). An organization to which employees are committed will experience better performance and will save resources on disciplining and hiring of staff (Steinhaus & Perry, 1996). Universities need highly skilled personnel with diverse experience to excel. However, it is sometimes difficult to find suitable candidates for certain positions (Ismail, 2012). Its difficult to find lecturers with good track records of excellence within their area of expertise to ensure that the missions and goals of the institution are carried out efficiently and with competence. Therefore, organizations have to try their best to meet the needs and demand of lecturers to retain personnel of diverse experience. Management must create a conducive working environment where lecturers have access to resources and well renumerated. Lecturers must have access to appropriate physical resources such as; proper workspace and lecture halls, working telephone line, adequate information systems and effective marketing materials, smart boards, markers, copy papers, photocopy machines, laptops and many more resource to survive.

Mowday, Steers, and Porter (1979:87) defined organizational commitment as: a strong belief in and acceptance of the organization's goals and values, a willingness to exert consider-able effort on behalf of the organization, and a strong desire to maintain member-ship in the organization.

However, it is very important that organizations determine variables that affect organizational commitment. The costs of hiring and training of new lecturers are high and can negatively disrupt and affect the work and progress of learning (Ismail, 201). When a lecturer resigns, students may remain without a lecturer for a while until another is hired. Students will miss out on learning as they wait for an appointment, unless a lecturer from that department can take the load. Employees need to be properly managed to ensure that an organization is competitive.

If workers are unhappy or dissatisfied, grievances may arise which may lead into low level of organizational commitment (Ismail, 2012). When lecturers experience dissatisfaction as a result of low pay, poor working conditions and little opportunities to grow, this may result in high turnover and absenteeism which will be costly to the institution. Lecturers need to be happy and satisfied to increase performance and reduce costs. They may be willing to take or help with any

job assignment assigned to them to keep working for the institution if there is a conducive working environment..

According to (Locke, 1976:34), Job satisfaction is the feeling of fulfilment and achievement that a person experienced in their job. This entirely depends on the mind and attitudes of employees of how they perceive their job. Attitudes towards colleagues, payment or renumerations and working conditions have an influence on job satisfaction of an individual. As defined by Swailes (2002:12), Organization commitment refers to employee's emotional attachment to, identification with, and involvement in the organization. It is very important that managers continuously assess the relationship between job satisfaction and organizational commitment of their employees to have an idea of how to satisfy their employees. When lecturers are committed they will be willing to grow in the institution and contribute to organizational goals.

Meyer and Allen (1991:12) identified three components of organizational commitment which are : Affective Commitment which involves emotional attachment to, identification with and involvement in the organization; whereas Continuance Commitment- reflects the costs associated with leaving the organization; and Normative Commitment- is experienced as a sense of obligation to remain with the organization.

Affective Commitment:

Affective commitment is the positive relationship between an individual and an organization as both share similar values (Meyer & Allen, 1991). When there are commonalities between an individual's own values and beliefs and of the organization it creates a sense of belonging and willingness to contribute to the organizational goals. Lecturers need to stay in the institution willingly because they believe in their ideology and share common goals. Employees who have developed a psychological attachment to an organization because of the passion and love/affection of their job tend to retain their position because of strong commitment as they need and want the occupation (Meyer, Allen & Smith, 1993). Lecturers need to stay in their organizations and retain their position not only because they need the occupation, but also because they want it. Commitment and passion must be the driving force to remain a member. Those who stay within their organization with a strong continuance commitment are there just because they need it.

Continuance commitment reflects economic ties to the organization because of fear of income loss. Employees tend to remain members of an organization due to economic and social benefits, of leaving the organization. According to Murray, Gregoire, and Downey (1991), Continuance commitment considers the ideas that individuals do not leave a company for fear of losing their benefits, taking a pay cut, and not being able to find another job. The organizational commitment based on benefits compromises performance. Lecturers should remain loyal and have the best interest of the organization at heart but not personal agendas and benefit at the expense of the organization. Sacrifices and lack of employment alternatives will increase costs on the organization.

Normative commitment explains the employees with strong normative commitment will remain with an organization by virtue of their belief that it is the "right and moral" thing to do (Meyer & Allen, 1991:56).

2.9 Organizational Performance

Organizations play an important role in the daily lives of every individual employee because they afford them room for self - actualization and therefore, successful organizations represent a key component for developing nations (Jarus, 2007). Thus, many economists resemble organizations and institutions as similar to an engine in determining the economic, social and political progress of any organization because it is only through performance that organizations are able to grow and progress (Jugdev & Mathur, 2012).

In the '50s organizational performance was defined as the extent to which organizations, viewed as a social system achieved their objectives (Georgopoulos & Tannenbaum, 1957). Performance evaluation during this time was focused on work, people and organizational structure. Later in the 60s and 70s, organizations have begun to explore new ways to assess their performance so performance was well-defined as an organization's ability to exploit its environment for retrieving and using the limited resources (Yuchtman & Seashore, 1967). The 80s and 90s were marked by the apprehension that the identification of organizational objectives is more complex than initially considered. Organizational managers began to comprehend that an organization is efficacious if it accomplishes its goals (effectiveness) using a minimum of resources (efficiency).

In an educational setting organizational performance is perceived as the extent to which the educational institution meets its organizational objectives and set goals i.e. making students pass and be absorbed into the job market or industry (Abdi & Williams, 2013). In educational settings, curriculum is set with the purpose of meeting the industrial demands for a nation. If educational institutions are meeting this national goal then they are regarded as meeting the expected level of organizational performance (Ahangar, 2011). Institutions where students are failing and are dropping out of school is said not to meet the goal and responsibility for which it is set to meet.

2.10 Summary

The chapter informed of the ideological framework underpinning this study, discussed prior literature related to the phenomena under study, exposed the knowledge gaps and offered critical questions which further justified the existence of this study. It also delved in greater detail on the concept of organisational performance.The next chapter expalins the research methodology, design and ethics among other.

Chapter 3 RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

In this chapter, the researcher explains the methodology, the research design, population, sample and sampling procedures which were used in the study. Issues related to data analysis, instrumentation and ethical considerations were also detailed.

3.2 Research Design

This study used a mixed research design that incorporated both quantitative and qualitative research design and it was informed by the fact that the weakness of one are complemented by the strength of the other (Cresswell, 2013). According to Anderson (2015:15), the advantages of a mixed research design are that one approach is used to enrich the other, increase validity through confirmation of results by other means of harnessing for data, complementarity and triangulation. Multiple individuals are reached out through the use of questionnaires, detailed responses are obtained through open ended questions which were part of the questionnaire and random sampling techniques were allowed to get the sample (Chiromo, 2006).

A mixed research approach enabled the researcher to personally administer the questionnaires, render assistance from a distance and make observations during the answering sessions.

3.2.1 Quantitative Research Design

According to Chiromo (2006:18), a quantitative research design is one in which the researcher wants to develop and employ mathematical models, theories and/ or hypotheses pertaining to phenomena. The process of measurement is central to quantitative research because it provides fundamental connection between empirical observation and mathematical expression of quantitative relationships. In this study, the researcher opted for a quantitative research design capacitates one to establish relationships between the variables, causation (cause and effect) and make predictions. More-so, extensive data is garnered through the administration of questionnaires and secondary sources. In the same vein it allowed the researcher to be objective in the sense that it only sought precise measurements and target concepts to answer her inquiry and it allowed for

data to be presented graphically in the form of tables and graphs (Kane & Brun, 2001). In light of the above, such a design was suitable for the study because it made the views, perceptions and data from Mathematics lecturers at The University of Namibia available for analysis. In this way the study was not a self-fulfilling prophecy but a critical analysis of the responses given in relation to the phenomena under study hence it made the study credible, relevant, valid and reliable hence easily generalizable (Chiromo, 2006).

3.2.2 Qualitative Research Design

Burns and Groves (1993), defined qualitative research as a systematic, interactive and subjective approach used to describe life experiences and giving them meaning. Qualitative research examines people's words and actions in narrative or descriptive ways more closely representing the situation as experienced by the participants (Maykut & Morehouse, 1994). In the same wave-length Anderson (2006:7) alluded that, qualitative research is much more exploratory, subjective, open-ended and used different data gathering tools such as questionnaire and interviews. It allows the researcher to ask the questions why and how?, thereby informing the researcher of the respondent's views, feelings, opinions and perceptions with respect to the phenomena under study. In light of the above, the qualitative design gave the respondents a higher degree of freedom and expression through open endedness of the questionnaire, hence the details that they gave were not limited or confined in any way.

This study used a quantitative and qualitative approach to determine the impact of organizational processes, lecturers' skills development, organizational resources, and lecturers' organizational commitment on organizational performance in the Mathematics Department at the University of Namibia. Quantitative research designs have the disadvantage that they cannot elicit perceptions and opinions of the participants though their findings can be subjected to hypothesis testing.

3.3 Population and Sample

A sample is a part of the entire population selected to participate in a study and it enables the researcher to obtain reliable, valid and honest data from relevant people. According to Kane and Brun (2001:95), "Sampling is advantageous in more ways than one because studying the entire population may take too long and cost too much, both in money and in opportunity time."Informed

of the above, it is true to pin point that sampling is key to the success of a study and the researcher is guaranteed of valid and reliable data if it is carefully drawn.

In line with the above, Brun et al (2001: 95) supposed that, as a researcher, if you want to be able to specify your study's margin of error and confidence level, that is if you want to be able to say how close your results would be to those obtained from the entire group, you must use a probability sample. This probability needs not necessarily be equal. It just needs to be known. Such a sample, if properly drawn and not invalidated by non-sampling errors, allows you to extend or generalize your results to a larger group without studying the group entirely. In line with the above, a sample is necessary if the study is dealing with a homogeneous population. This means the members are similar in terms of the characteristics that interest you such as the level of education.

3.3.1 Purposive Sampling

According to Patton (1990:30), purposive sampling is getting rich information from a special group of people who meet the requirements, understand a certain dimension better, occupy a strategic position or perform certain tasks that concern your study. The researcher learnt from this technique and relied on it by handpicking only lecturers and assistant lecturers of Basic Mathematics from seven campuses of The University of Namibia leaving out the rest who had no connection with the phenomena under study. The lecturing compliment of UNAM is 1193 but attention was paid to Department of Mathematics which has a total of 80 lecturers and assistant lecturers and questionnaires were administered to 55 randomly selected mathematics lecturers across seven compasses of the University. The sampling was done to save time, for convenience purposes and on the grounds that they possess the knowledge or are the ones who are responsible for the discharge of Mathematics at the University of Namibia.

3.4 Data Collection Method

3.4.1 Questionnaires

Haralambos and Holborn (2004;18) stated that, a questionnaire is self -printed report consisting of well - crafted questions that evoke thoughts and responses to address the core of the phenomena under scrutiny. The use of self-administered questionnaires is advantageous in that, there is simplicity of administration, easy of construction, economical and the capacity to gather large

chunks of relevant data for analysis from participants in a very short space of time (Ncube, 2017). Onwuegbuzie and Johnson (2004:10) stated that, "Questionnaires are more objective and cheaper to design in collecting a lot of information in little time."

In sync with the above, Kane and Brun (2001:111) postulated that, through a questionnaire, the respondents fill on a standardised form which can be distributed to a large number of people to get a broad set of representative responses to questions about attitude, perceptions and behaviour. Computerised processing and analysis can bring speed and rigor which has to be obtained in more cumbersome ways using some other methods. That said questionnaires can tell what is happening, what people say they do, think or feel, if appropriate questions are posed., if they are prepared and able to give answers. Besides being descriptive, they can be analytical hence can test hypotheses.

Questionnaires can be employed to get a general picture, to get the baseline information among others. However there are challenges encountered with this method because they cannot capture cultural patterns. According to Kane and Brun (2001: 112) , Questionnaires are thought to be easy and fast to get information, but by the time a good survey of 200 people is designed, administered and processed, a considerable amount of time will have passed .

Cognizant of the above, ordinal data were collected using a 6-point Likert scale and the questionnaires were administered personally to the participants. The research instrument (questionnaire) was adapted from previous studies (Dumas, et al., 2013; De Vos, et al., 1998; Ombaka et al., 2015; Bajpai, 2011) and was revised were necessary (please refer to Appendix A for the questionnaire).

With respect to the above, the study used structured questionnaires with close and open ended questions to measure the lecturers understanding of the factors that are contributing to poor performance in Basic Mathematics at the University. The questions were carefully crafted, consistently administered and fairly distributed and any assistance needed was rendered

3.5 Data Analysis

A Statistical Package for the Social Science analysis plan package SPSS Version 25 was used to analyze the data because it enabled adequate analysis of results whereas Excel is limited to statistical operations. The data analyzed was Ordinal because of the Linkert scale. Linkert scale

was used because it measures the respondent's attitudes - the extent to which they agree or disagree with the statement or question. It helps the researcher to access how respondents feel about a certain issue. The linkert scale from 1 – 6 was used in the questionnaire as strongly disagree (1); disagree (2); disagree moderately (3); agree moderately (4); agree (5) and strongly agree (6). During the analysis of data they were then collapsed into 1 – 4 scale because there is not much difference between strongly agree and moderately agree or strongly disagree and moderately disagree as to strongly disagree (1); disagree (2); strongly agree (3) and agree (4).

Chi-square test was used to compare the dependence or relationship between variables. For the test to be significant the relationship between variables is supposed to be less than 0.05, $P<0.05$. If the assumptions of the Chi-square test was violated or if the cells had expected counts less than 5 the Fisher's Exact Test is used instead of the Chi-square Test. The significance of the statistical test was stated at P value that is less than 0.05 level of significance on which the test was carried out.

The reliability of the scale was measured using Cronbach's alpha where the appropriate cut – off points are;

0.9 and above shows excellent reliability

0.7 to 0.9 shows high reliability

0.5 to 0.70 shows moderate reliability

0.5 and below shows low reliability (Hinton, Brownlow, McMurray & Cozens., 2004)

3.6 Validity and Reliability

Validity is primarily concerned with measures that lead to the eradication of bias in the data collection and data analysis processes and this adds much to the credibility of the study thereby making it generalizable. On the other hand reliability concerns itself with an instrument measuring the quality and performing efficiently and effectively the task to which is designed for (Chiromo, 2006).

The research instrument (questionnaire) was adapted from previous studies (Dumas et al., 2013; Jehanzeb & Bashir., 2013; Ombaka et al., 2015; Kashefi et al., 2013) and was revised were necessary (*please refer to Appendix 1 for the questionnaire*). Also, the respondents were very

pleased and fascinated about the whole research project as they felt that it is good and up to standard as it has covered all relevant areas of their concern. Respondents hope that their concerns will at last be addressed if relevant authorities read the document as some of the raise issues are long overdue. According to Maitra and Yan (2008:87), "validity is concerned with ensuring that items chosen to assess a given construct are an appropriate representation thereof". The questionnaire had measured what it is supposed to measure. The study used Cronbach's alpha coefficient to assess the internal consistency-reliability of the scale used in this research. Reliability reflects that the research instrument would yield the same findings if used at different times or if administered to the same group over and over again (Maitra & Yan., 2008:88). The reliability of this questionnaire was measured at $\alpha = 0.575$

This means that the questionnaire was moderately reliable (Hinton, Brownlow, McMurray & Cozens., 2004).

In this regard the questions crafted on the questionnaires originated from the research topic itself and were consistent with the research aims and objectives. No questions outside the confines and parameters of this research were asked and the researcher never disguised or misrepresented herself in the data gathering process. In the data analysis process the researcher focused on the responses given by the participants, and holistically drew conclusions using her experience, knowledge and insights gained from the study. No prejudice, bias or emotional attachment was allowed to play a role in both the data gathering and data analysis processes.

3.7 Ethical Considerations

The advent of civilization made both human beings and inanimate objects become autonomous, assertive and self-defining and this is what ethics imply. Since research involves working with people seeking their consent is the first thing to do. Privacy, anonymity and confidentiality were ensured to protecting them from harm, paying reverence to their rights as humans and being honest in coming up with the conclusion during analysis. Informed of the above, the researcher put the safety and security, interests and rights of the participants, first and did not employ any militaristic, coercive or threatening tactics to acquire data for the purposes of analyses in the study. Furthermore, no financial burden was put to the participants and all costs and expenses incurred

were at the researcher responsibility. Permission letters or ethical clearance certificates from the University of Namibia and University of Stellenbosch were granted to conduct the study.

3.8 Summary

The chapter dealt with the methodology of the study by detailing on the research designs, data gathering instruments, data analysis procedures and ethics. It also further informed and provided justification of the population and sampling. It also presented issues related to ethical consideration in relation to the study. The next chapter will present the results from the questionnaire.

Chapter 4 PRESENDATION OF FINDINGS

4.1 Introduction

This chapter details on the presentation and discussion of data obtained from the questionnaires that were issued out to the respondents. It blends the reviewed literature with the responses given and the discussion of the data follows.

4.2 Biographical information of the participants

4.2.1 Participants' gender

The study prompted the participants of the gender with the purpose of understanding how the University manpower which participated in the study was distributed. The figure below shows the results from the participants:

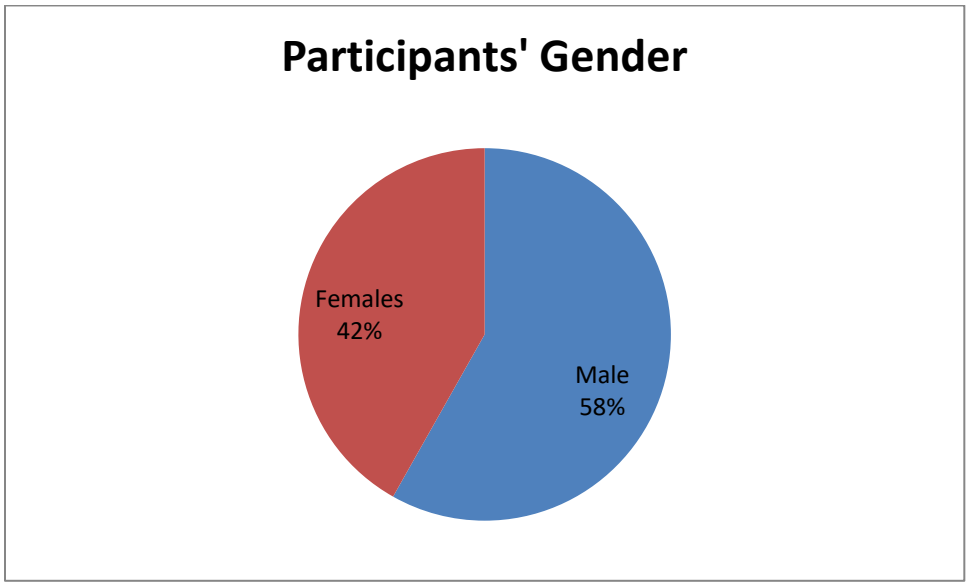

Figure 4.1: Participants' Gender

The figure shows that 42% of the respondents who participated in the survey were female whilst 58% were male, representing 100% response rate. These findings seem to concur with the belief that mathematics is a subject that is preferred by males because of its level of difficulties. These findings imply that fewer women qualify to become University Mathematics lecturers.

4.2.2 Participants' qualifications

The researcher established the qualifications which the participants in the study had. The figure below shows the respondents' results on this aspect.

Participants' Qualifications

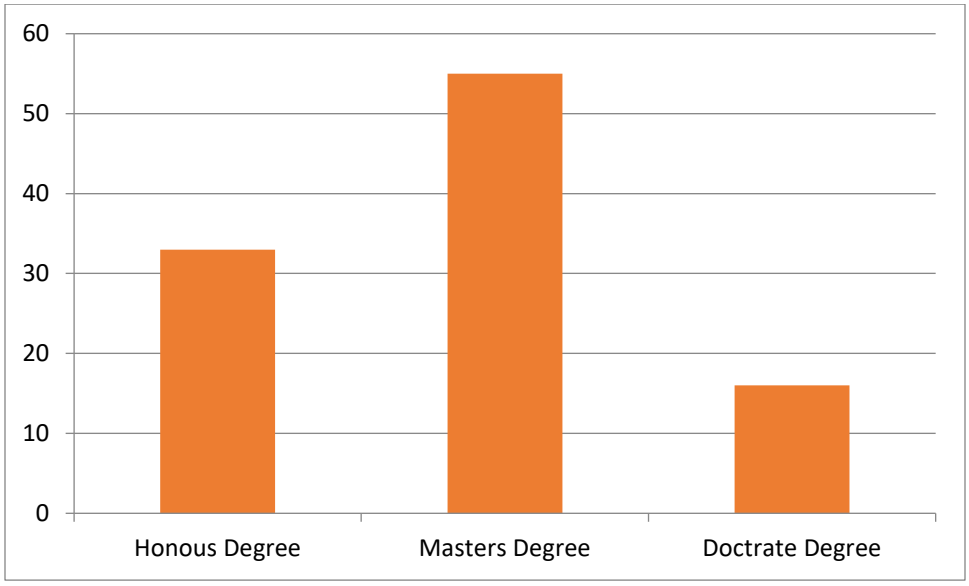

Figure 4.2: Participants' Qualifications

The figure above reflects that majority of the participants have a masters degree 28 (51%), followed by Hons degree – first degree18 (33 %) and then PhD (Doctrate degree) 9(16%). Most of these lecturers are furthering their studies for personal and organizational growth. Every Institution requires a strong educated workforce.

4.2.3 Participants' experience

The study unveiled the participants' level of experience in the teaching of mathematics including Basic Mathematics. The table below shows the participants' responses on this aspect.

Table 4.1: Participants' experience

Experience (years)	Frequency
<5	5
5-10	15
10-19	16
20-25	5
>25	9

The table shows that nine participants had taught mathematics for more than 9 years, five had taught it for a period of 20-25 years, 16 had taught it between 10 and 19 years, five had taught it for a period less than five years. These findings show that a good number of participants (the majority had taught Basic Mathematics for more than five years) have vast experience in teaching mathematics. These findings concur with earlier findings of Mohr (1982) who indicated that individuals who have stayed with an organization are in a better position to understand organizational processes than those individuals who are new to the organization. Such members are in a good position to explain the shortcomings which may be in the organization since they are more enlightened on the organizational procedures and processes.

4.3 Presentation of data

4.3.1 Descriptive statistics from Frequency tables

The description of how each question was answered in all five domains is in Appendix B. For full detail refer to frequency tables at the Appendix.

However, the study established that all participants strongly agree for all sub-domains.

4.3.2 Descriptive statistics from crosstabs

```
GET
  FILE='E:\H DATA set 1.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
RECODE P1 P2 P3 P4 P5 P6 P7 P8 P9 SD1 SD2 SD3 SD4 SD5 SD6 OR1 OR2 OR3 OR4 OR5 OR6 OC1 OC2 OC3 OC4 OC5
OC6 OC7 OC8 OC9 OC10 OP1 OP2 O
    P3 OP4 OP5 OP6 OP7 OP8 (1=1) (6=4) (2 thru 3=2) (4 thru 5=3).
EXECUTE.
SAVE OUTFILE='E:\H DATA set 2.sav'
  /COMPRESSED.
```

Table 4.2: The dependency of Organizational Processes, P and Organizational Performance, OP (by P6 and OP5) in the teaching of Basic Mathematics

Crosstab of P6 and OP5

			OP5			
			Disagree	Agree	Strongly Agree	Total
P6	Strongly Disagree	Count	1	14	7	22
		% of Total	1.8%	25.5%	12.7%	40.0%
	Disagree	Count	0	8	4	12
		% of Total	.0%	14.5%	7.3%	21.8%
	Agree	Count	0	5	16	21
		% of Total	.0%	9.1%	29.1%	38.2%
Total		Count	1	27	27	55
		% of Total	1.8%	49.1%	49.1%	100.0%

FET: P-value=0.011

There is significant dependency between P6 and OP5 in the teaching of basic mathematics with a P-value of 0.011. Domain P6 means that we constantly pilot with new ideas to improve our educational processes while OP5 means that our department has adequate capacity to react appropriately and expeditiously to change.

From those who strongly disagree for P6, 12.7% strongly agree, 25.5% agree and 1.8% disagree with OP5. Of the participants who disagree for P6, 7.3% strongly agree, 14.5% agree and 0.0% (none) disagree with OP5. The ones who agree for P6, 29.1% strongly agree, 9.1% agree and 0.0% (none) disagree with OP5.

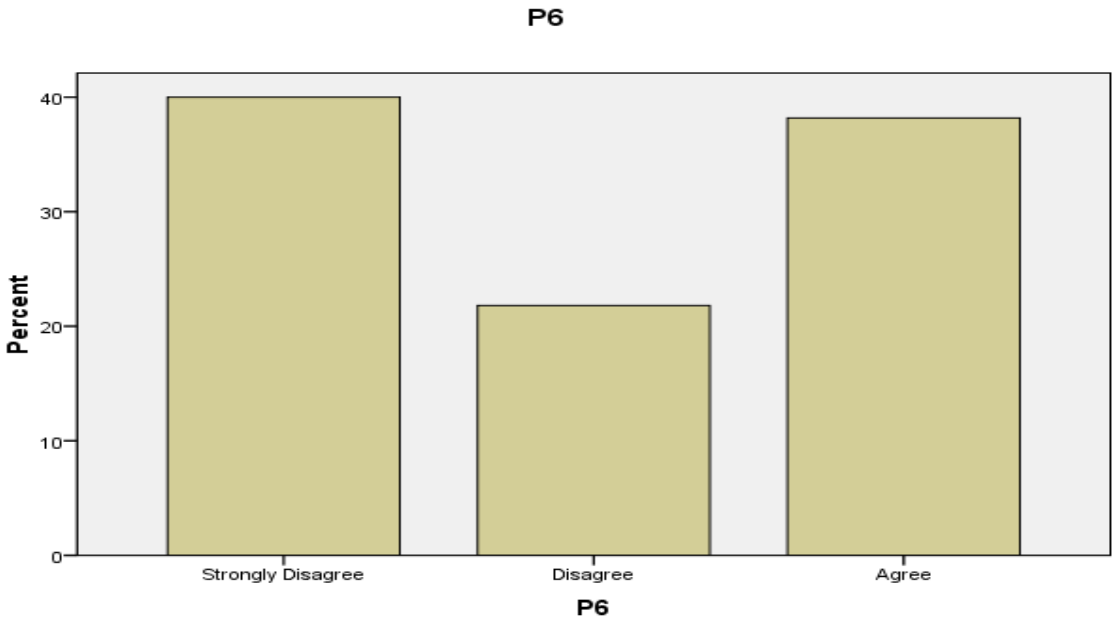

Figure 4.3: Organizational Processes, P6

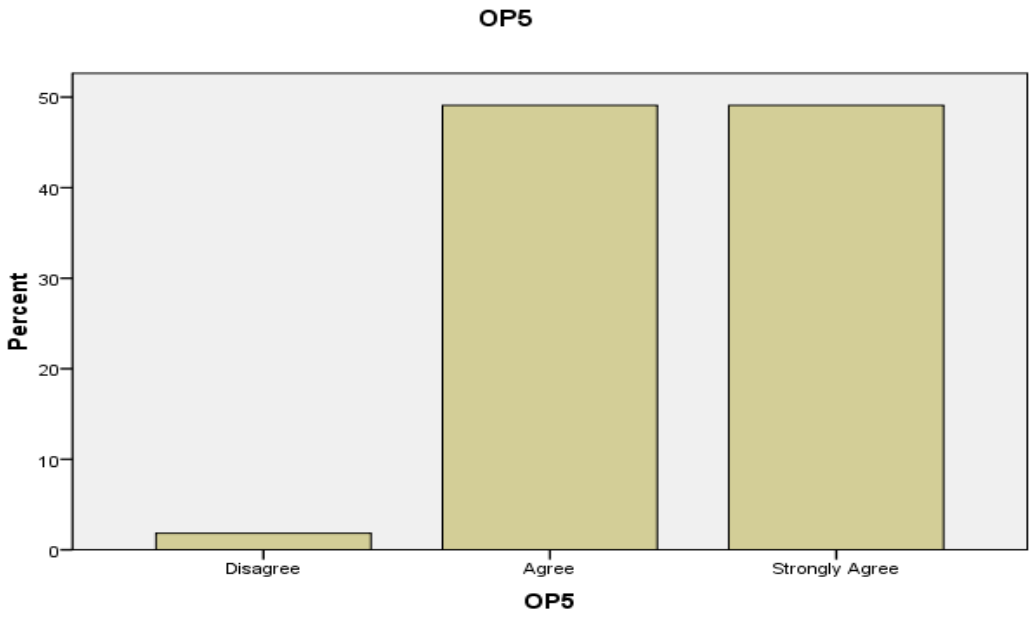

Figure 4.4: The Organizational Performance, OP5

From table 4.2 and figure 4.3 and 4.4 above, it shows that for P6 40% strongly disagree, 21.8% and 38.2% disagree and agree respectively. It can be noted that 1.8% disagree, 49.1% agree and 49.1% strongly agree for the OP5.

In domain P6, 40% of the participants strongly disagree and 21.8% disagree that new ideas are constantly being piloted to improve the educational processes. These results concur with Ahagar (2011), who stated that management should provide administrative support to teaching and learning. There should be a constant piloting of new ideas to improve the educational processes. Without new ideas and tasks, the passing of Basic Mathematics might not be possible. These tasks may include tutorials, tests, home works for the students and some mathematics symposia which students need to undertake to boost their understanding of Basic Mathematics. In the case of the Mathematics Department at the University of Namibia, this includes administrative support, the teaching methods and curriculum, the assessment methods, resource allocation, decision-making, as well as rules and procedures of the teaching of Basic Mathematics. Constantly changing of teaching or lecturing methods might improve performance.

As literature indicated, managers should work through others to ensure that processes provide possible solutions.

With regards to OP5 – our department has adequate capacity to react appropriately and expeditiously to change. Majority strongly agree 49.1% and 49.1% agree that the department react timeously to change which is a good culture. Viewing change in a positive light promotes problems into opportunities.

Table 4.3: The dependency of Organizational Processes, P and Organizational Performance, OP (by P8 and OP5) in the teaching of Basic Mathematics

Crosstab of P8 and OP5

			OP5			
			Disagree	Agree	Strongly Agree	Total
P8	Strongly Disagree	Count	1	1	0	2
		% of Total	1.8%	1.8%	.0%	3.6%
	Disagree	Count	0	3	1	4
		% of Total	.0%	5.5%	1.8%	7.3%
	Agree	Count	0	15	12	27
		% of Total	.0%	27.3%	21.8%	49.1%
	Strongly Agree	Count	0	8	14	22
		% of Total	.0%	14.5%	25.5%	40.0%
Total		Count	1	27	27	55
		% of Total	1.8%	49.1%	49.1%	100.0%

FET: P-value =0.037

There is significant dependency between P8 and OP5 in the teaching of basic mathematics with a P-value of 0.037

Domain P8 means the Science Foundation Programme is very effective while OP5 indicates that our department has adequate capacity to react appropriately and expeditiously to change.

Participants who strongly disagree for P8, 0.0% (none) strongly agree, 1.8 % agree and 1.8% disagree with OP5. Part of those who disagreed with P8, 1.8% strongly agree, 5.5% agree and 0.0% (none) disagree with OP5. Of the participants who agree for P8, 21.8% strongly agree, 27.3% agree and 0.0% (none) disagree with OP5. Those who strongly agree for P8, 25.5% strongly agree, 14.5% agree and 0.0% (none) disagree with OP5.

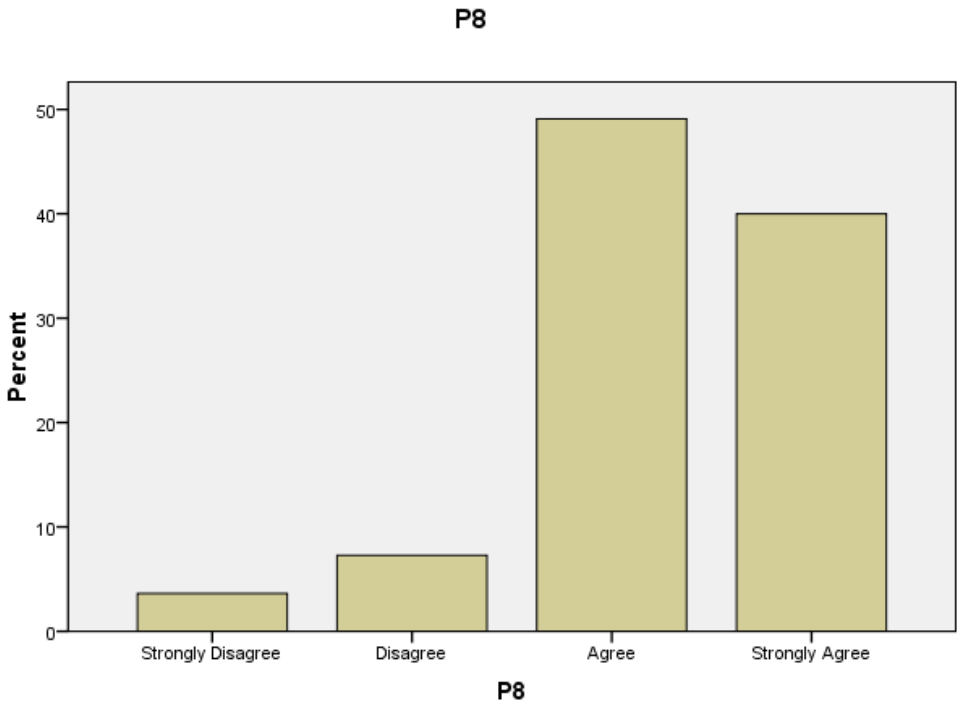

Figure 4.5: Organizational Processes, P8

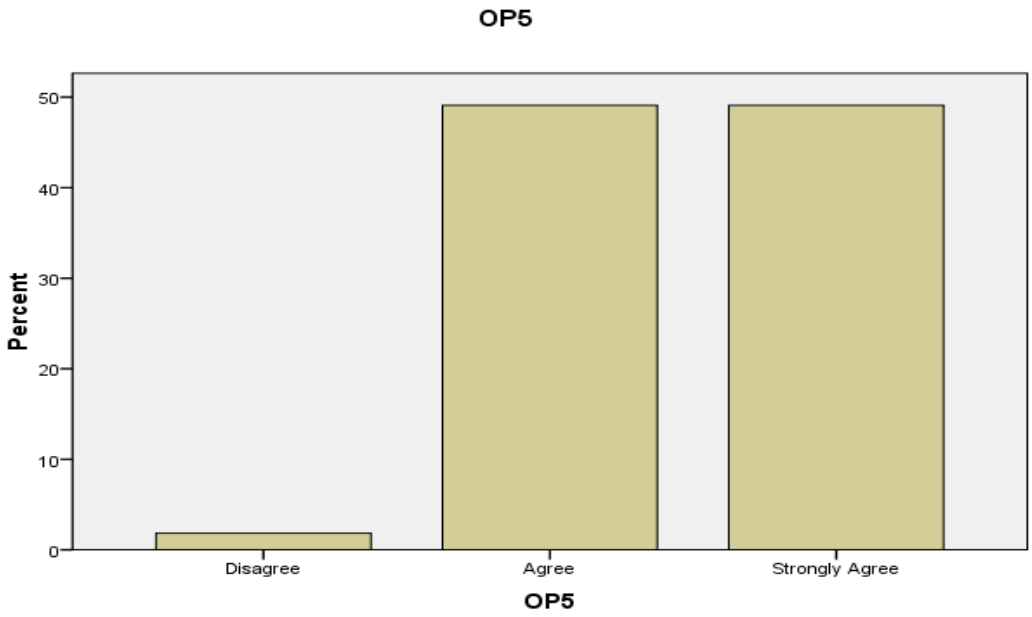

Figure 4.6: Organizational Performance, OP5

From table 4.3; graph 4.5 and 4.6 above, it shows that for P8, 3.6% strongly disagree, 7.3% disagree, 49.1% agree and 40.0% strongly agree. It can be noted that 1.8% strongly disagree, 49.1% agree and 49.1% strongly disagree for OP5.

With regards to P8 – Science Foundation Programme is very effective, 49.1% and 40.0% of the respondents agree and strongly agree, respectively. The Science Foundation Programme is a bridging course aimed at strengthening skills and understanding of former Grade 12 learners in English, Physics, Biology, Chemistry and Mathematics. The goal of Foundation Programmes is to increase the enrollment numbers of students and production of competent science and technology graduates for Namibia's growing economy. Since mathematics is a compulsory module and a pre-requisite for all courses in the faculty of science in Namibia, most students struggle to cope with Basic Mathematics content because of weak mathematics foundation. Upon completion of the bridging course, students are expected to have a better mathematical understanding, change in attitude towards mathematics and a strong confidence in doing mathematics. Most of the students who have gone through this programme perform exceptionally well in Basic Mathematics. Thus the majority of lecturers are in support of the programme.

The major concern or challenge in Namibia is the decrease in mathematics enrolments. This is compounded by inadequate performance among those that are enrolled. According to Miranda and Gideon (2011:4), first year mathematics students' poor performance at the University of Namibia has been on the rise for the past ten years. Furthermore, Miranda, et al., (2013) indicated that first year mathematics students' pass rates are extremely low and continually below average (50 percent). In this light the generality of the students are not at liberty or are reluctant to handle the mathematics context in this module, hence they move to the subsequent year with first year modules pending (Miranda,Gideon and Mugochi, 2013). Some students later change field of studies to departments where mathematics is not offered in an attempt to avoid this perceived stumbling block of advancement(Miranda, et al., 2013).

In an effort to improve performance in Mathematics at tertiary level, the University of Namibia embarked on an academic development programme called "*Science Foundation Programme*".

With regards to OP5 – our department has adequate capacity to react appropriately and expeditiously to change. Lecturers strongly agree (49.1%) and 49.1% agree that the department react timeously to change. Viewing change in a positive light promotes problems into opportunities. The department fully support the Science Foundation Program because it closes the gap between high school and tertiary curriculum. This programme is offered only at two campuses and the demand from the community is very high.

Table 4.4: The dependency of Lecturer's Skills Development, SD1 and Organizational Processes, OP7 (by SD1 and OP7) in the teaching of Basic Mathematics

Crosstab of SD1 and OP7

			OP7		
			Agree	Strongly Agree	Total
SD1	Strongly Disagree	Count	9	26	35
		% of Total	16.4%	47.3%	63.6%
	Disagree	Count	11	9	20
		% of Total	20.0%	16.4%	36.4%
Total		Count	20	35	55
		% of Total	36.4%	63.6%	100.0%

FET: P-value= 0.043

There is significant dependency between SD1 and OP7 in the teaching of basic mathematics with a P-value of 0.043

Domain SD1 means lecturers get adequate exposure to contemporary maths teaching methods while OP7 means we have a good reputation for education/ service delivery.

Those who strongly disagree for SD1, 47.3% strongly agree and 16.4% agree with OP7. The participants who disagree with SD1, 16.4% strongly agree and 20.0% agree with OP7.

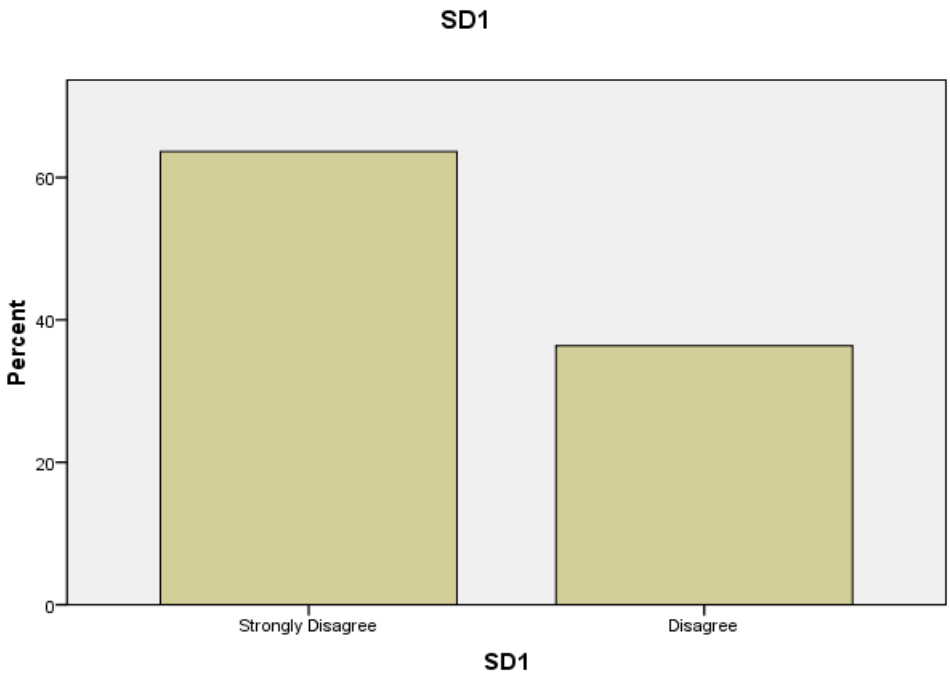

Figure 4.7: Skills Development, SD1

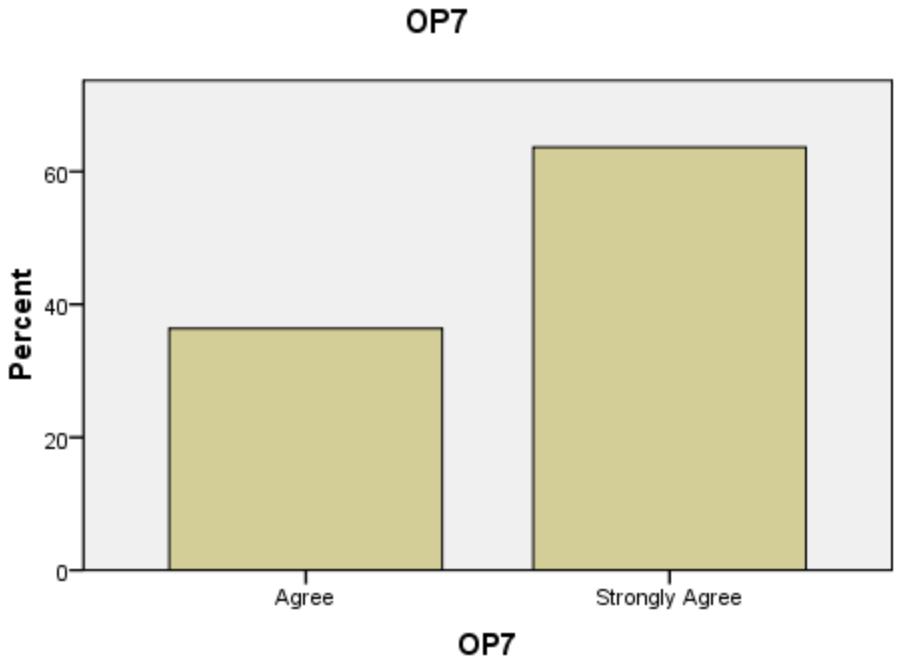

Figure 4.8: Organizational Performance, OP7

From table 4.4, graph 4.7 and 4.8 above, it shows that for SD1, 63.6% strongly disagree and 36.4% disagree for OP7. It can be noted that 63.6% strongly agree and 36.4% agree for OP7.

The graphs above shows that 63.6% respondents strongly disagree with domain SD1 – lecturers get adequate exposure to contemporary maths teaching methods. Lecturers need to constantly receive necessary training to improve organizational performance. Continuous staff training enhances skill development (Hamid, 2016). In the higher education sector, lecturers are the driving force of performance in tertiary institutions. Therefore, lecturers' confidence should be enhanced to be competent enough to uplift the standards of the institution. Niazi (2011) points out that due to pressure, business environments have caused organizations to become 'Learning Organizations' which adjusts and innovates in order to keep abreast of the technological trends and to be ahead of their competitors. Lecturers need adequate exposure to contemporary mathematics teaching methods to confidentially facilitate the construction of knowledge to students in a bid to enhance their performance.

As for domain OP7- we have a good reputation for education/ service delivery, 63.6% of respondents strongly agree with the statement. The University of Namibia is the oldest and biggest university in the country with the good reputation for education. It has produced the most graduates in the country.

Table 4.5: The dependency of Lecturer's Skills Development, SD2 and Organizational Processes, P9 (by SD2 and P6) in the teaching of Basic Mathematics

Crosstab of SD2 and P9

			P9			
			Strongly Disagree	Disagree	Agree	Total
SD2	Strongly Disagree	Count	4	1	0	5
		% of Total	7.3%	1.8%	.0%	9.1%
	Disagree	Count	36	6	1	43
		% of Total	65.5%	10.9%	1.8%	78.2%
	Agree	Count	2	5	0	7
		% of Total	3.6%	9.1%	.0%	12.7%
Total		Count	42	12	1	55
		% of Total	76.4%	21.8%	1.8%	100.0%

FET: P-value =0.013

There is significant dependency between SD2 and P9 in the teaching of basic mathematics with a P-value of 0.013

Domain SD2 - training support for the relevant personnel is available while P9 - the current High school Mathematics curricula is appropriate in preparing students for tertiary level.

Participants who strongly disagree for SD2, 0.0% (none) agree, 1.8% disagree and 7.3% strongly disagree with P9. Of the participants who disagree with SD2, 1.8% agree, 10.9% disagree and

65.5% strongly disagree with P9. The ones who agree for SD2, 0.0% (none) agree, 9.1% disagree and 3.6% strongly disagree for P9.

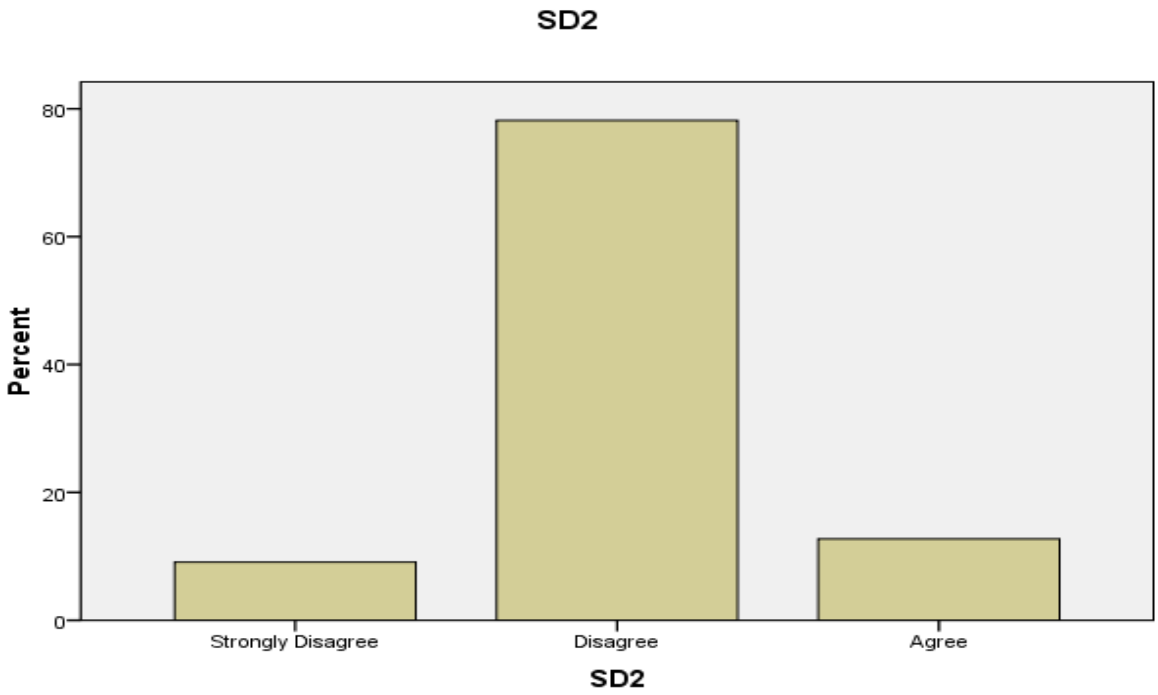

Figure 4.9: Skills Development, SD2

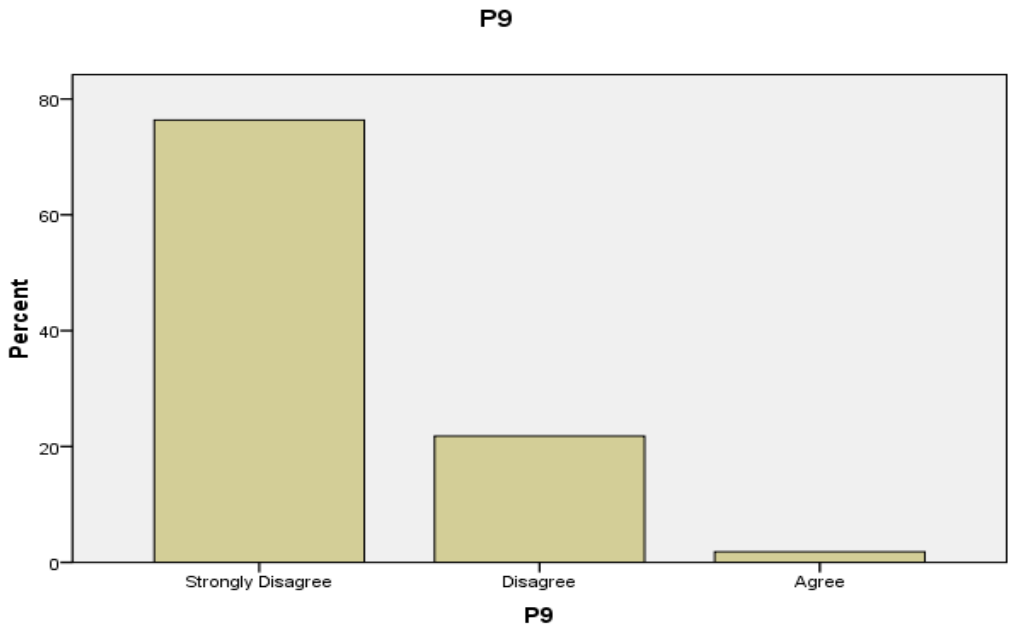

Figure 4.10: Organizational Processes, P9

Table 4.5; graph 4.9 and 4.10 above shows that for domain SD2, 9.1% strongly disagree, 78.2% disagree and 12.7% agree respectively. It can be noted that 76.4% strongly disagree, 21.8% disagree and 1.8% agree for the P9.

The result above shows that 76.4% and 21.8% strongly disagree and disagree respectively for P9. Domain P9 - the current High School Mathematics curricula is appropriate in preparing students for tertiary level. It can be concluded that the majority of respondents do not support the high school curriculum. According to Miranda and Gideon (2011:4), first year mathematics students' poor performance at the University of Namibia has been on the rise for the past ten years. Miranda, et al., (2013) stated that, first year mathematics students' pass rates are extremely low and continually below average (50 percent). Generally, some students are not capable to handle the mathematics context in this module, hence they move to the subsequent year with first year modules pending (Miranda,Gideon and Mugochi, 2013). Some students later change field of studies to departments where mathematics is not offered in an attempt to avoid this perceived stumbling block of advancement(Miranda, et al., 2013). In the same token, a study was conducted in South Africa by The South Africa Institute of Physics and Council for Higher Education (CHE)

spearheaded by Nkosi (2013) on the unpreparedness of first year University Maths students and it unearthed that learners perform poorly at University level due to lack of thorough preparation in Mathematics at the Matric level. This is a global issue of concern. Indeed the issue of poor performance in Mathematics is a thorny one across all the levels of education but the prior studies did not investigate adequately on what roles, responsibilities and obligations do the universities hold in order to remedy the inconsistencies and sad situation at hand. According to prior study conducted, poor performance in mathematics by students is seemingly to be an issue of concern universally (Salman, et al., 2010:97). Githua (2013:75) stated that, despite the importance of mathematics in our daily lives and working environment, mathematics pass rates have been poor internationally and in Kenya.

The major challenge Namibia is experiencing is the decrease in mathematics enrolments in university mathematics department and inadequate performance among those that are enrolled. Miranda et al. (2013) discovered that, the majority of students have weaknesses in comprehending mathematics concepts and themes for instance, inequalities, polynomials, functions, sets, sequences, partial fractions and absolute value in Basic mathematics.

Moreover, Miranda et al. (2013;10) stated that, the Namibian school mathematics curriculum (National Secondary School Certificate – NSSC) does not prepare learners with necessary basic mathematics skills for year one university mathematics as most of the content that is supposed to be taught is not covered in the (NSSC – curriculum) (MINISTRY OF EDUCATION,2007,2010). The above findings are in line with the lecturers responses. This can be one of the contributing factors to poor performance in mathematics at the University of Namibia. It can be concluded that High school curriculum need to be reviewed.

Domain SD2- Training support for relevant personnel is available, which is one of the crucial components of every organization for effective performance. Of the respondents, 9.1% strongly disagree and 78.2% disagree with domain SD2. Training should be considered as an essential component of every organization to ensure effective organizational management (Obi - Anike and Ekwe, 2014). Lectures must get opportunities to attend conferences, workshops and any other educational symposium to gain knowledge. Training helps discover employees' talents and unlock their potentials in their disciplines.

Obi - Anike and Ekwe (2014:20) further argued that, on job training is designed and intended to widen the knowledge, greater confidence and higher degree of performance. Staff development equips people with required knowledge to perform their duties or improve their skills for growth. Well trained staff helps improve organizational effectiveness, increase individual and organizational competences, and close the gaps.

Skills development defines the systematic planned programmes that are aimed at improving employees' aptitudes, attitudes and behaviours through informative learning events and instructions which empower them by acquiring necessary skills and knowledge which will make them competent personnel who can execute their work efficiently (Jehanzeb & Bashir, 2013). It is therefore, important to offer lecturers opportunities to acquire knowledge and improve skills for growth.

Table 4.6: The dependency of Lecturer's Skills Development, SD6 and Organizational Processes, P2 (by SD6 and P2) in the teaching of Basic Mathematics

Crosstab of SD6 and P2

			P2				
			Strongly Disagree	Disagree	Agree	Strongly Agree	Total
SD6	Disagree	Count	0	0	3	0	3
		% of Total	.0%	.0%	5.5%	.0%	5.5%
	Agree	Count	2	6	5	9	22
		% of Total	3.6%	10.9%	9.1%	16.4%	40.0%
	Strongly Agree	Count	0	2	11	17	30
		% of Total	.0%	3.6%	20.0%	30.9%	54.5%
Total		Count	2	8	19	26	55
		% of Total	3.6%	14.5%	34.5%	47.3%	100.0%

FET: P-value=0.027

There is significant dependency between SD6 and P2 in the teaching of basic mathematics with a P-value of 0.027

Domain SD6 - lecturers know what the key skills are that our department needs in the next five years while P2 - work procedures and objectives are well documented in our department.

From those who disagree for SD6, 0.0% (none) strongly agree, 5.5% agree, 0.0% (none) disagree and 0.0% (none) strongly disagree with P2. Of the participants who agree with SD6, 16.4% strongly agree, 9.1% agree, 10.9% disagree and 3.6% strongly disagree with P2. The ones who strongly agree for SD6, 30.9% strongly agree, 20.0% agree, 3.6% disagree and 0.0% (none) strongly agree for P2.

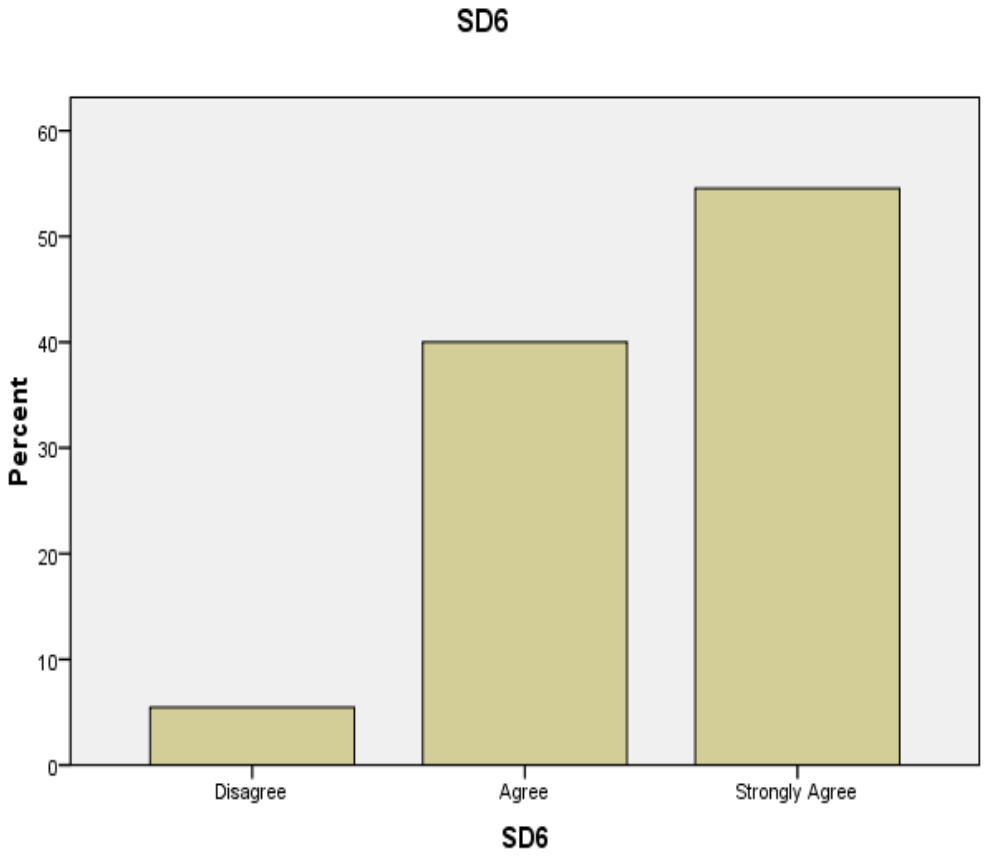

Figure 4.11: Skills Development, SD6

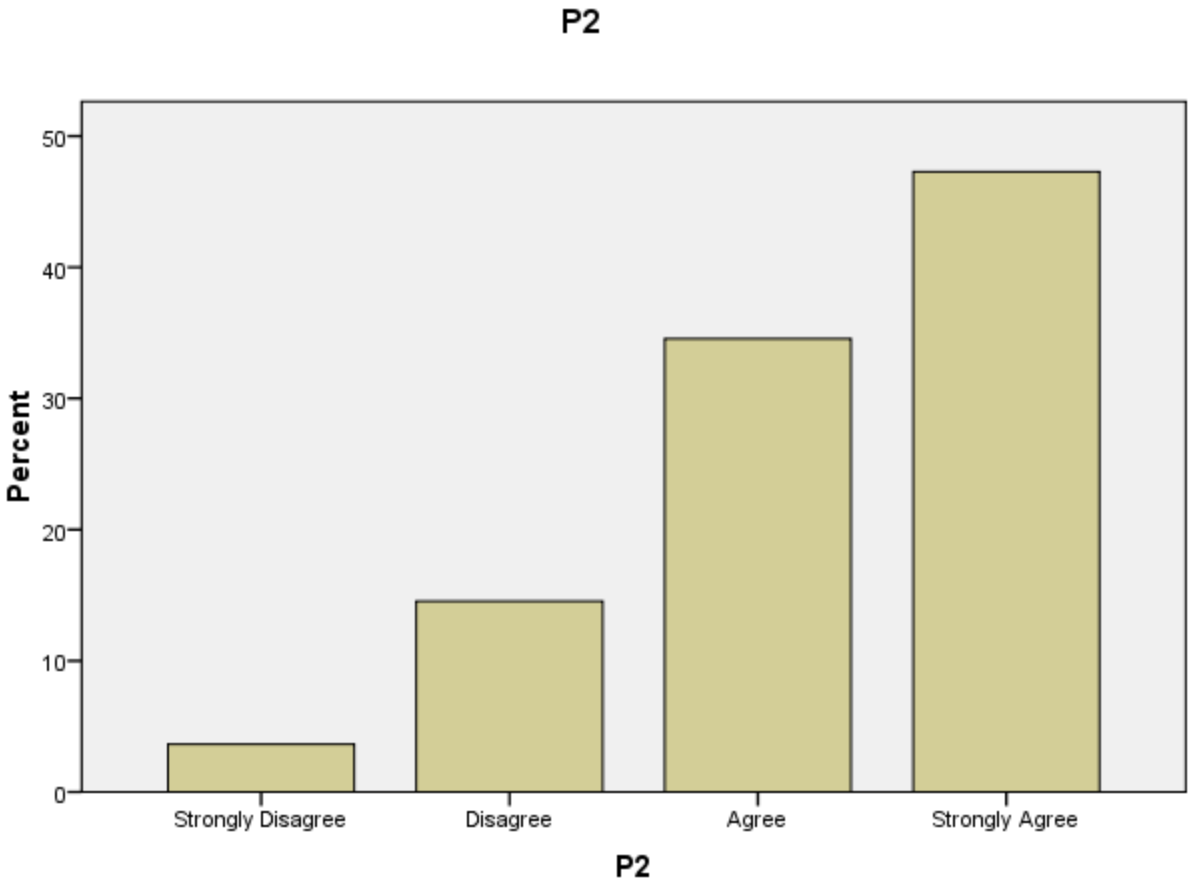

Figure 4.12: Organizational Processes, P2

From table 4.6; graph 4.11 and 4.12 above, it shows that for SD6 5.5% answered disagree, 40.0% agree, 54.5% strongly agree respectively. It can be noted that 47.3% strongly agree, 34.5% agree, 14.5% disagree and 3.6% strongly disagree for the P2.

Domain SD6 - lecturers know what the key skills are that our department needs in the next five years. Respondents strongly agree (54.5%) and agree (40.0%) that lecturers know the key skills the department needs in the next five years. Supporting the above, skills development is also viewed as planned programmes by an organization which enables employees to learn and acquire job-related competencies (Hameed & Waheed, 2011).

As of domain P2 – work procedures and objectives are well documented in our department. Participants strongly agree (47.3%) and agree (34.5%) that the work procedures and objectives are well documented in the department. Providing adequate information flow – both vertically and horizontally, organizational processes are a vital element in ensuring that an organization's goals are effectively achieved (Dumas et al., 2013:4). Every lecturer need to be well acquainted with the work procedures and objectives and not operate in a vacuum. They are therefore aware of what is expected of them. Every employee's contribution counts on an organizational effectiveness.

Table 4.7: The dependency of Lecturer's Skills Development, SD6 and Organizational Performance, OP5 (by SD6 and OP5) in the teaching of Basic Mathematics

Crosstab of SD6 and OP5

			OP5			
			Disagree	Agree	Strongly Agree	Total
SD6	Disagree	Count	1	1	1	3
		% of Total	1.8%	1.8%	1.8%	5.5%
	Agree	Count	0	17	5	22
		% of Total	.0%	30.9%	9.1%	40.0%
	Strongly Agree	Count	0	9	21	30
		% of Total	.0%	16.4%	38.2%	54.5%
Total		Count	1	27	27	55
		% of Total	1.8%	49.1%	49.1%	100.0%

FET: $P<0.01$ ($P=1.85366^{-4}$)

There is significant dependency between SD6 and OP5 in the teaching of basic mathematics with a P-value of 1.85366^{-4}

Domain SD6 - lecturers know what the key skills are that our department needs in the next five years while OP5 - our department has adequate capacity to react appropriately and expeditiously to change.

Those who disagree for SD6, 1.8% strongly agree, 1.8% agree and 1.8% disagree with OP5. Of the participants who agree with SD6, 9.1% strongly agree, 30.9% agree and 0.0% (none) disagree with OP5. The ones who strongly agree for SD6, 38.2% strongly agree, 16.4% agree and 0.0% (none) disagree for OP5.

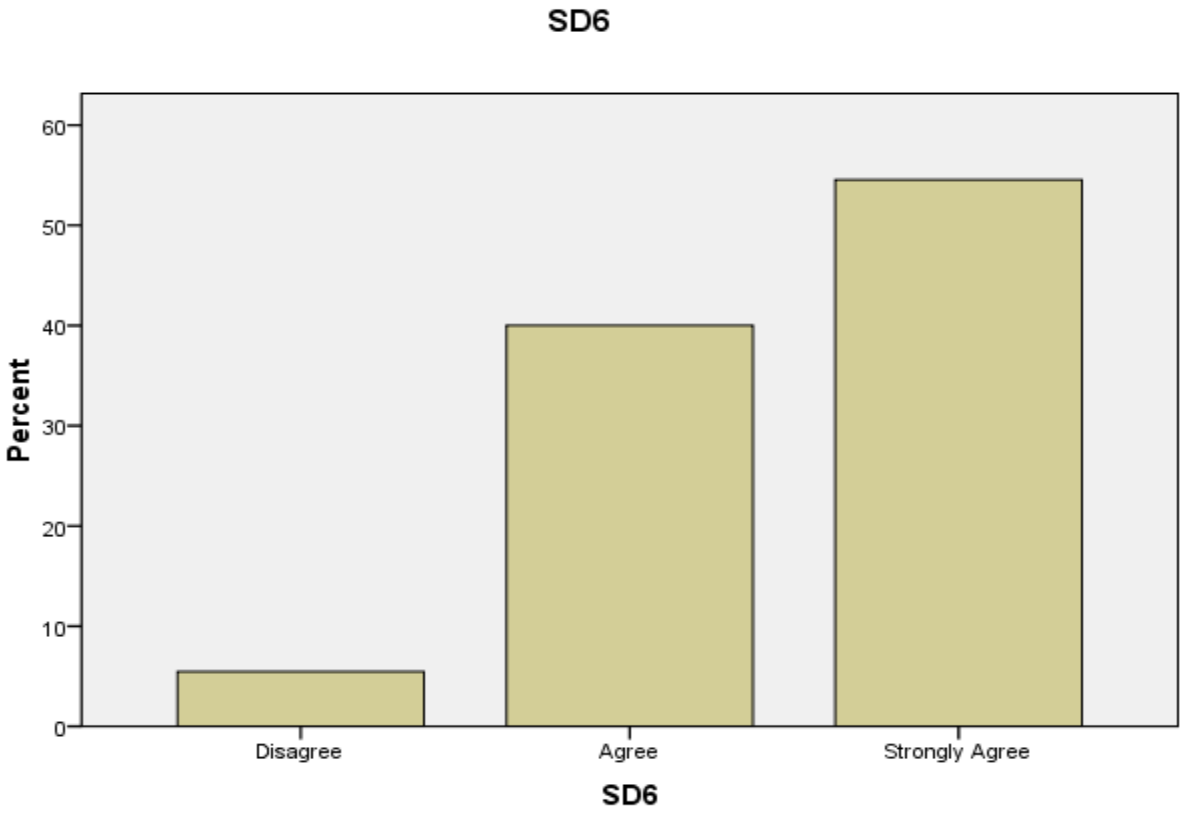

Figure 4.13: Skills Development, SD6

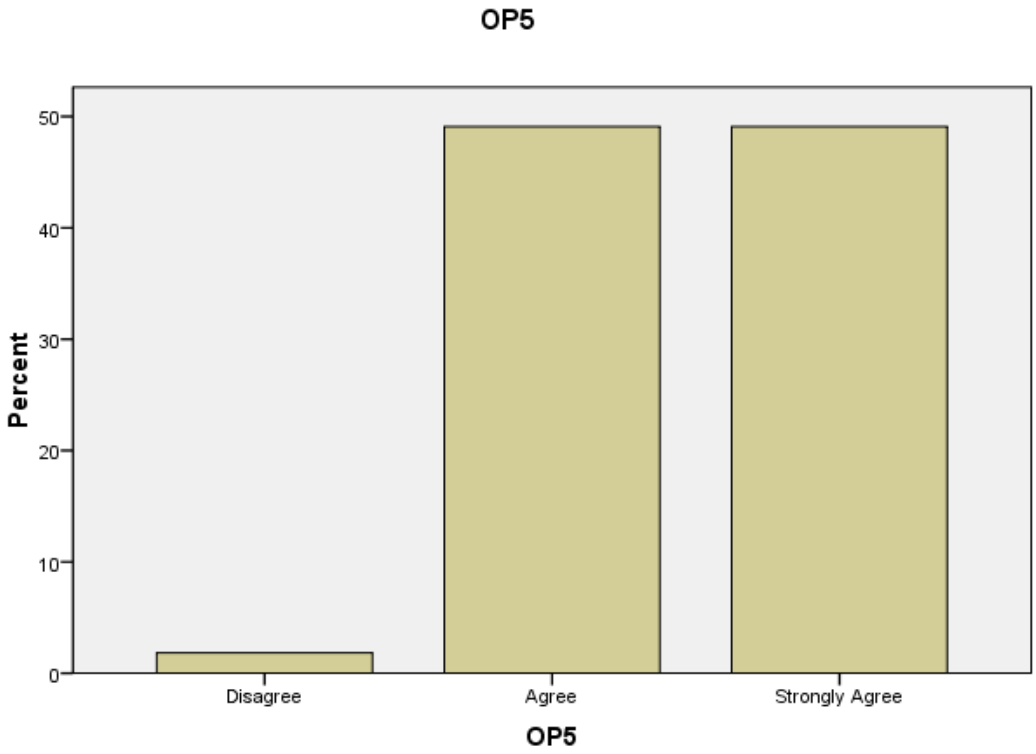

Figure 4.14: Organizational Performance, OP5

From table 4.7; graph 4.13 and 4.14 above, it shows that for SD6 5.5% answered disagree, 40.0% agree, 54.5% strongly agree respectively. It can be noted that 49.1% strongly agree, 49.1% agree and 1.8% disagree for the OP5.

Domain SD6 - lecturers know what the key skills are that our department needs in the next five years. Respondents strongly agree (54.5%) and agree (40.0%) that lecturers know the key skills the department needs in the next five years. This is in line with the findings by Hameed and Waheed (2011) who indicated that skills development is also viewed as planned programmes by an organization which enables employees to learn and acquire job-related competencies.

In light of the above the experience one has accrued in a certain organization, sustained skills development can be a vital factor for the enhancement of employee's effectiveness (Jehanzeb & Bashir, 2013). Planning is therefore a crucial aspect in an organization as the day to day activities determines the future. To expand on the above, Hameed and Waheed (2011) postulated that, "The

focus of several programs of employee skills development is novel skills, methods, and notions that may have been unknown or unavailable at the time of initial recruitment. In this parlance, it has been demonstrated that organizations which invest adequately in programs of employee skills development enjoy improved organizational performance (Jehanzeb & Bashir, 2013; Hameed & Waheed, 2011).

With regards to OP5 – our department has adequate capacity to react appropriately and expeditiously to change. Participants strongly agree (49.1%) and agree (49.1%) that the department react appropriately to change. Skilful and capable lectures will be able to handgrip change expeditiously and view change in a positive light that promotes problems into opportunities.

Table 4.8: The dependency of Lecturer's Skills Development, SD6 and Organizational Performance, OP6 (by SD6 and OP6) in the teaching of Basic Mathematics

Crosstab of SD6 and OP6

			OP6				
			Strongly Disagree	Disagree	Agree	Strongly Agree	Total
SD6	Disagree	Count	1	2	0	0	3
		% of Total	1.8%	3.6%	.0%	.0%	5.5%
	Agree	Count	4	10	8	0	22
		% of Total	7.3%	18.2%	14.5%	.0%	40.0%
	Strongly Agree	Count	2	2	13	13	30
		% of Total	3.6%	3.6%	23.6%	23.6%	54.5%
Total		Count	7	14	21	13	55
		% of Total	12.7%	25.5%	38.2%	23.6%	100.0%

FET: $P<0.01$ ($P=2.0751431^{-5}$)

There is significant dependency between SD6 and OP6 in the teaching of basic mathematics with a P-value of 2.0751431^{-5}

Domain SD6 - lecturers know what the key skills are that our department needs in the next five years while OP6 - our internal strength is adequate (financial resources, physical assets and materials; and quality and diversity of staff).

From those who answered disagree for SD6, 0.0% (none) strongly agree, 0.0% (none) agree, 3.6% disagree and 1.8% strongly disagree with OP6. Of the participants who agree with SD6, 0.0% (none) strongly agree, 14.5% agree, 18.2% disagree and 7.3% strongly disagree with OP6. The ones who strongly agree for SD6, 23.6% strongly agree, 23.6% agree, 3.6% disagree and 3.6% strongly disagree for OP6.

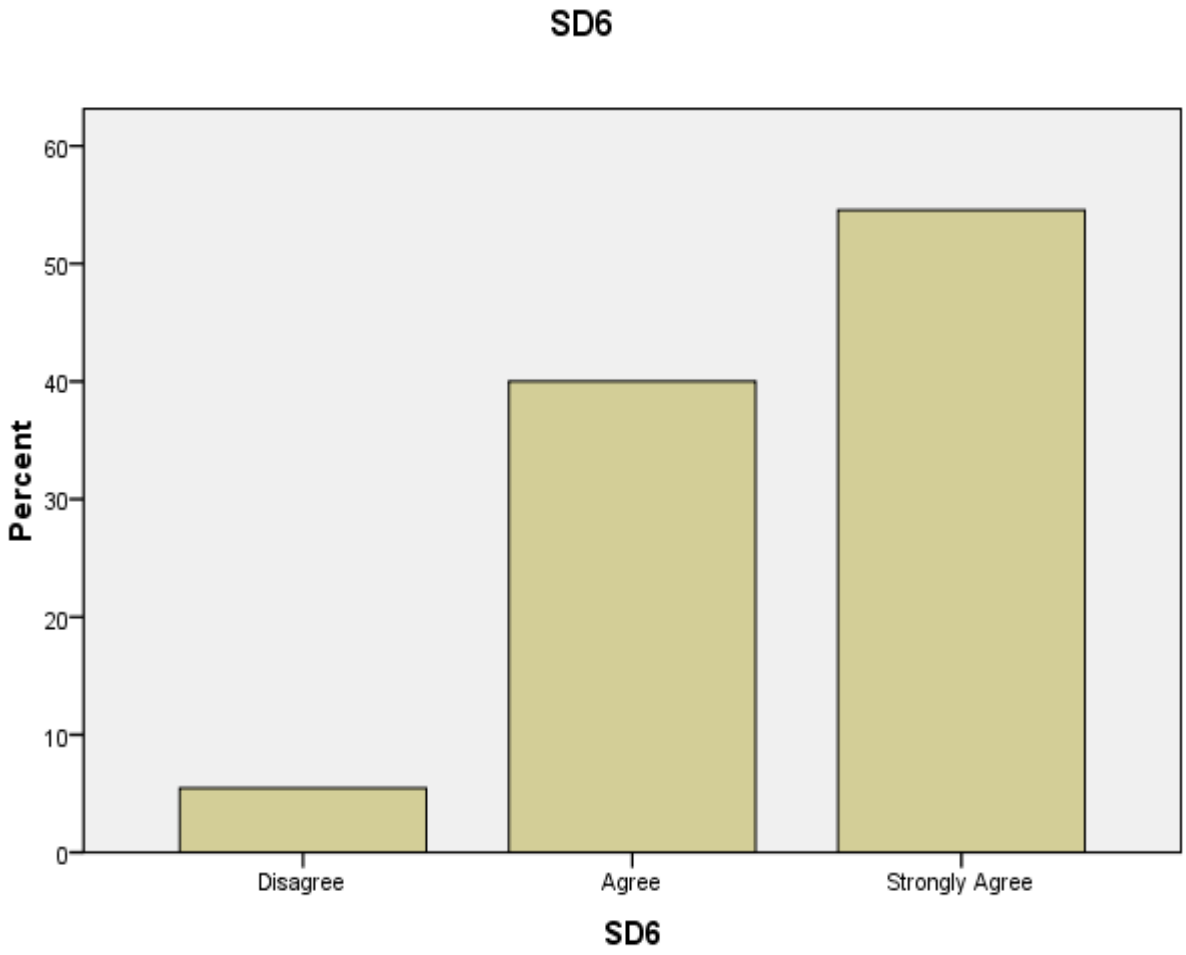

Figure 4.15: Skills Development, SD6

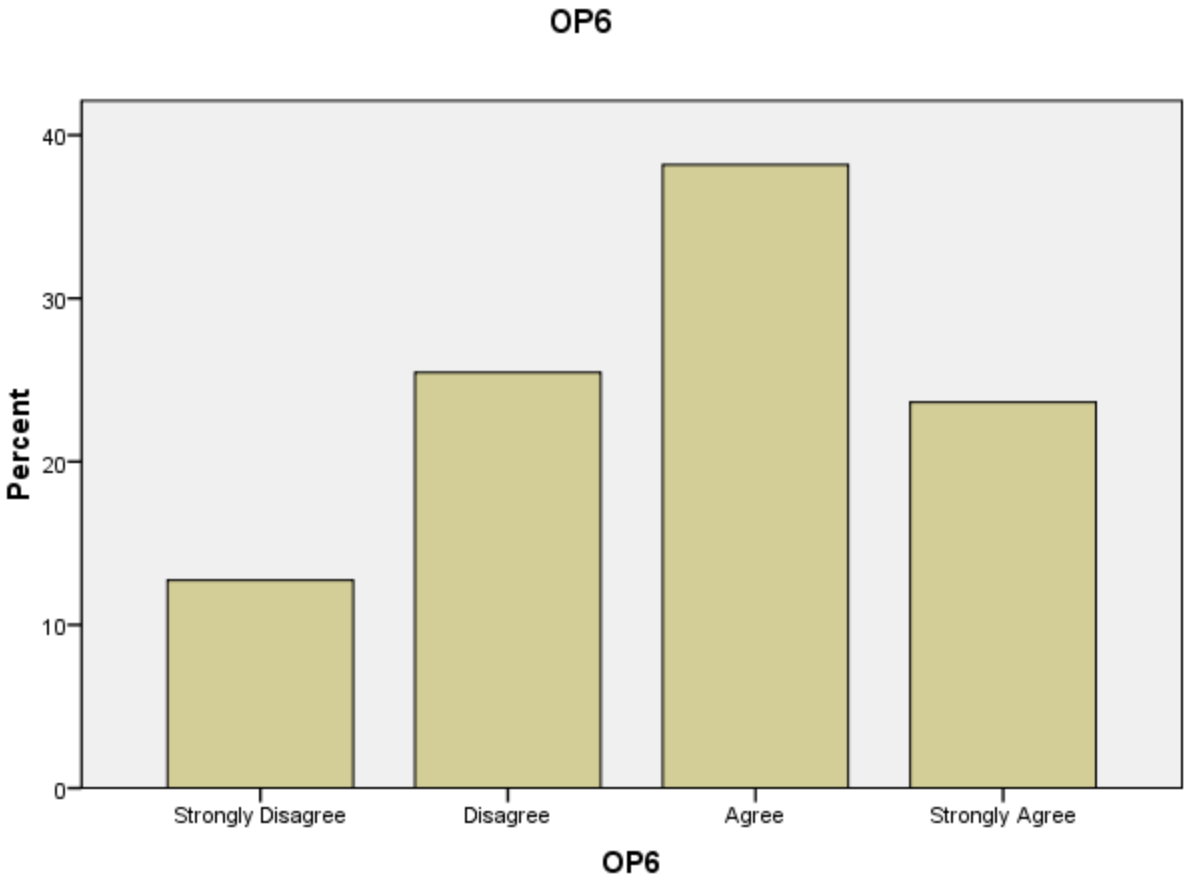

Figure 4.16: Organizational Performance, OP6

From table 4.8; graph 4.15 and 4.16 above, it shows that for SD6, 5.5% answered disagree, 40.0% agree, 54.5% strongly agree respectively. It can be noted that 23.6% strongly agree, 38.2% agree, 25.5% disagree and 12.7% strongly disagree for the OP6.

Domain SD6 - lecturers know what the key skills are that our department needs in the next five years. Respondents strongly agree (54.5%) and agree (40.0%) that lecturers know the key skills the department needs in the next five years. Supporting the above, skills development is also viewed as planned programmes by an organization which enables employees to learn and acquire job-related competencies (Hameed & Waheed, 2011). Organizations need to invest in improving employees knowlegdge and skills to increase productivity and efficiency.

In light of the above the experience one has accrued in a certain organization, sustained skills development can be a vital factor for the enhancement of employee's effectiveness (Jehanzeb & Bashir, 2013). Planning is therefore a crucial aspect in an organization as the day to day activities determines the future. To expand on the above, Hameed and Waheed (2011) postulated that, "The focus of several programs of employee skills development is novel skills, methods, and notions that may have been unknown or unavailable at the time of initial recruitment. In this parlance, it has been demonstrated that organizations which invest adequately in programs of employee skills development enjoy improved organizational performance (Jehanzeb & Bashir, 2013; Hameed & Waheed, 2011).

OP6 - our internal strength is adequate (financial resources, physical assets and materials; and quality and diversity of staff). Of the participants, 23.6% and 38.2% strongly agree and agree respectively that internal strength is adequate. Organizational performance is one of the most important variables in the management research and debatably the most important pointer of the organizational performance (Vukonjanski & Nikolić, 2013).

Table 4.9: The dependency of Organizational Resources, OR3 and Organizational Performance, OP2 (by OR3 and OP2) in the teaching of Basic Mathematics

Crosstab of OR3 and OP2

			OP2		
			Agree	Strongly Agree	Total
OR3	Disagree	Count	0	2	2
		% of Total	.0%	3.6%	3.6%
	Agree	Count	16	9	25
		% of Total	29.1%	16.4%	45.5%
	Strongly Agree	Count	24	4	28
		% of Total	43.6%	7.3%	50.9%
Total		Count	40	15	55
		% of Total	72.7%	27.3%	100.0%

FET:P=0.015

There is significant dependency between OR3 and OP2 in the teaching of basic mathematics with a P-value of 0.015

Domain OR3 - our personnel are highly capable in multiple roles and committed to mission, strategy, and continuous learning while OP2 - effectiveness is always ensured by adequate lecturers and processes.

From those who disagree for OR3, 3.6% strongly agree and 0.0% (none) agree with OP2. Of the participants who agree with OR3, 16.4% strongly agree and 29.1% agree with OP2. The ones who strongly agree for OR3, 7.3% strongly agree and 43.6% agree for OP2.

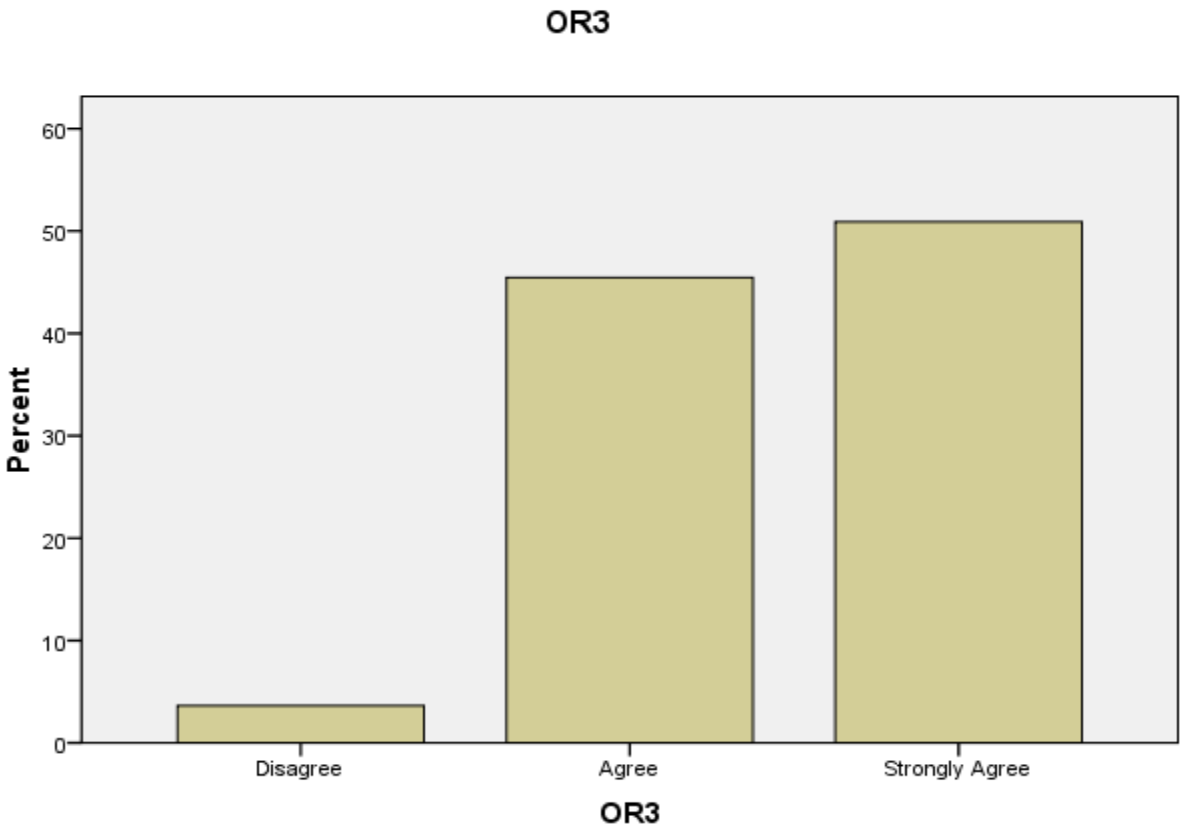

Figure 4.17: Organizational Resources, OR3

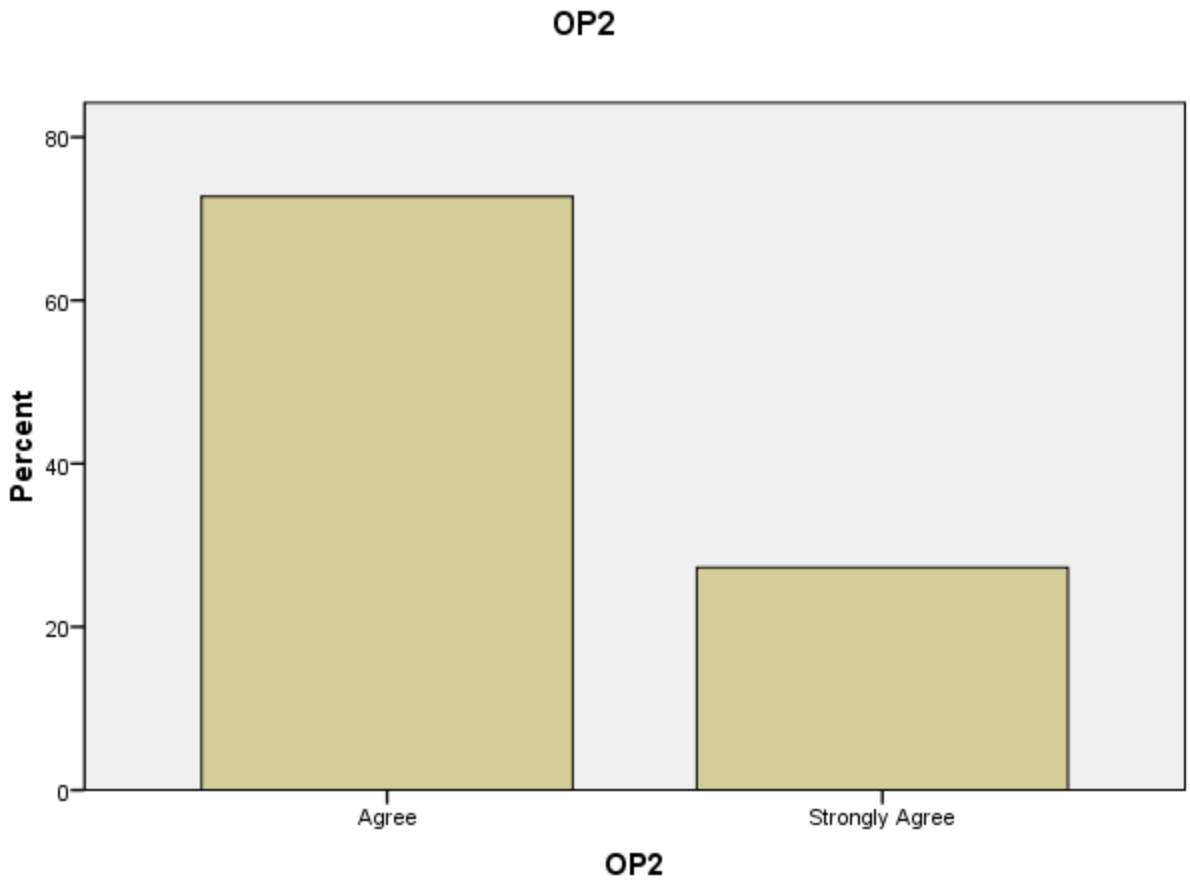

Figure 4.18: Organizational Performance, OP2

From table 4.9; graph 4.17 and 4.18 above, it shows that for OR3, 3.6% disagree, 45.5% agree, 50.9% strongly agree respectively. It can be noted that 27.3% strongly agree and 72.7% agree for the OP2.

Domain OR3 – our personnel are highly capable in multiple roles and committed to mission, strategy, and continuous learning. Most of the respondents strongly agree 50.9%, 45.5% agree that our personnel are highly capable in multiple roles and committed to mission, strategy, and continuous learning. Every organization has a mission, vision and aims, that is a purpose and it takes communication to make this purpose known and after that the success of the institution mainly relies on commitment of the employees.

Committed employees remain loyal to the organization, share the same values and goals of the organization (Mowday, Porter & Steers, 1982).

Universities need highly skilled personnels with diverse experience to excel. However, it is sometimes difficult to find suitable candidates for certain positions (Ismail, 2012). Its difficult to find lecturers with good track records of excellence within their area of expertise to ensure that the missions and goals of the institution are carried out efficiently and with competence. Therefore, organizations have to try their best to meet the needs and demand of lecturers to retain personnels of diverse experience.

Domain OP2- effectiveness is always ensured by adequate lecturers and processes. As indicated by the results 72.7% agree and 27.3% strongly agree that adequate lectures and processes enhance effectiveness. The results concur with Ombaka et al (2015), who stated that organizational resources have a great influence on the organizational performance. Inadequate teaching and learning resources may be a challenge to acquire in learning institutions because they can be costly. Without proper adequate resources, companies would fail to achieve high level of efficiency and competent workforce.

Table 4.10: The dependency of Organizational Resources, OR4 and Organizational Performance, OP3 (by OR4 and OP3) in the teaching of Basic Mathematics

Crosstab of OR4 and OP3

			OP3		
			Agree	Strongly Agree	Total
OR4	Strongly Disagree	Count	7	13	20
		% of Total	12.7%	23.6%	36.4%
	Disagree	Count	3	31	34
		% of Total	5.5%	56.4%	61.8%
	Agree	Count	0	1	1
		% of Total	.0%	1.8%	1.8%
Total		Count	10	45	55
		% of Total	18.2%	81.8%	100.0%

FET:P=0.047

There is significant dependency between OR4 and OP3 in the teaching of basic mathematics with a P-value of 0.047

Domain OR4 is all positions within the Mathematics department are adequately and appropriately staffed while OP3 is the work atmosphere (integration, commitment and cohesion) is very good.

From those who strongly disagree for OR4, 23.6% strongly agree and 12.7% agree with OP3. Of the participants who disagree with OR4, 56.4% strongly agree and 5.5% agree with OP3. The ones who agree for OR4, 1.8% strongly agree and 0.0% (none) agree for OP3.

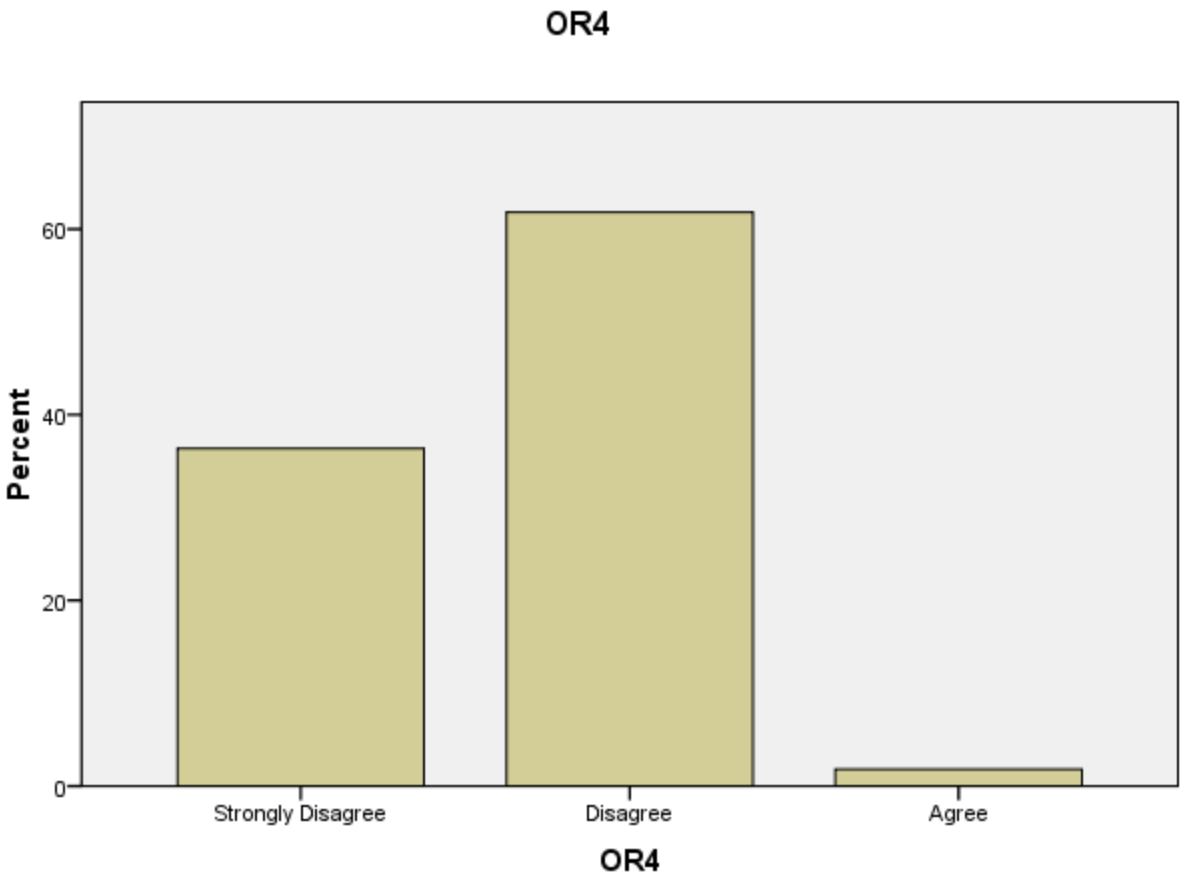

Figure 4.19:Organization Resources, OR4

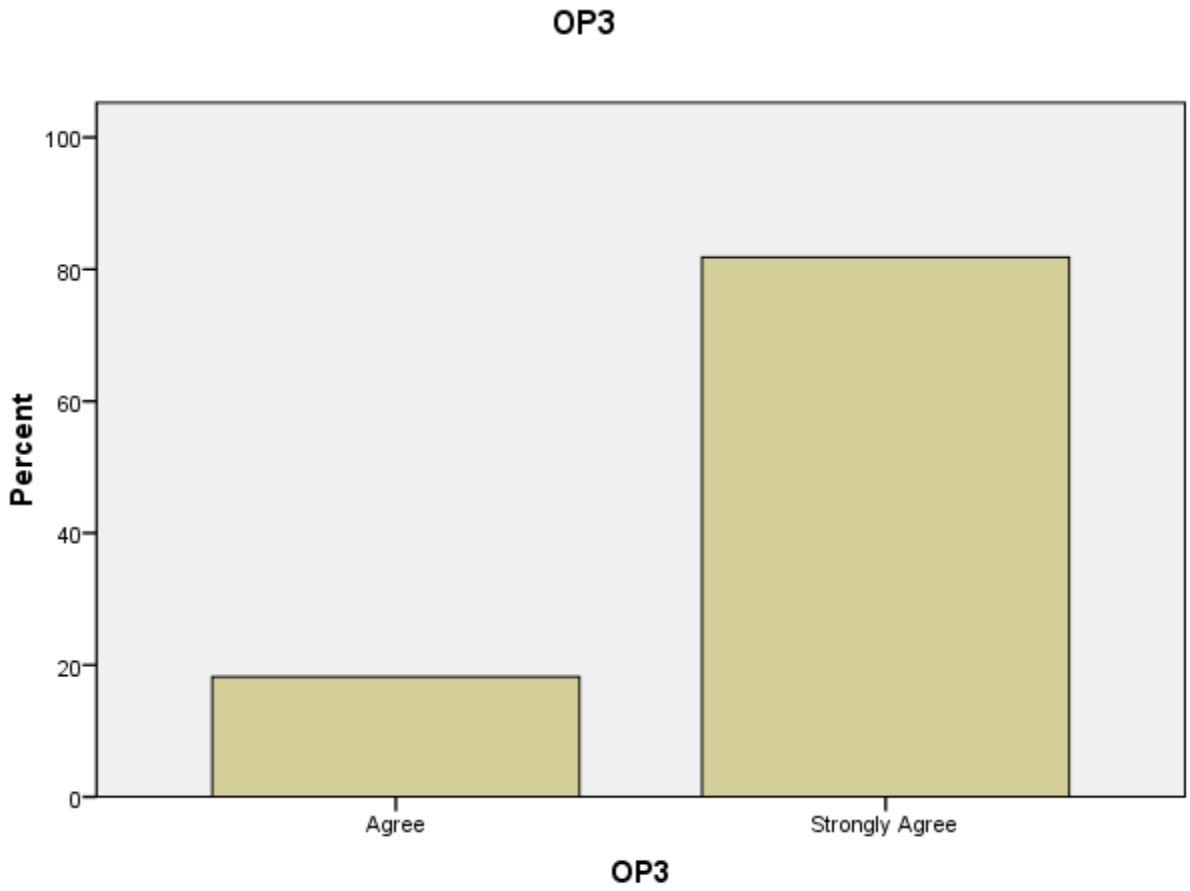

Figure 4.20: Organizational Performance, OP3

From table 4.10; graph 4.19 and 4.20 above, it shows that for OR4, 36.4% strongly disagree, 61.8% disagree, 1.8% agree respectively. It can be noted that 81.8% strongly agree and 18.2% agree for the OP3.

OR4 - all positions within the Mathematics department are adequately and appropriately staffed. The result indicates that 36.4% strongly disagree and 61.8% disagree that all positions within the Mathematics department are adequately and appropriately staffed. Shortage of staff may affect teaching, learning and performance as lecturers may be overloaded. Universities need to invest in their lecturers' professional and personal development and recruit more staff to have a strong and committed workforce. Employees are the most important resource for any company that it uses to

accomplish goals. No amount of force, coercion, threats, intimidation and spying can make people pull in the direction of the organization if they do not feel the need to do so (Musaazi,1982).

OP3 - the work atmosphere (integration, commitment and cohesion) is very good. The result indicates that 81.8% strongly agree and 18.2% agree that the work atmosphere is very good. An organizational success depends greatly on the willingness of the human resources to accomplish the purpose to which the organization is in existence hence devotion and commitment matter the most.

Table 4.11: The dependency of Organizational Resources, OR5 and Organizational Performance, OP4 (by OR5 and OP4) in the teaching of Basic Mathematics

Crosstab of OR5 and OP 4

			OP4			
			Disagree	Agree	Strongly Agree	Total
OR5	Strongly Disagree	Count	4	5	6	15
		% of Total	7.3%	9.1%	10.9%	27.3%
	Disagree	Count	0	7	18	25
		% of Total	.0%	12.7%	32.7%	45.5%
	Agree	Count	1	3	11	15
		% of Total	1.8%	5.5%	20.0%	27.3%
Total		Count	5	15	35	55
		% of Total	9.1%	27.3%	63.6%	100.0%

FET:P=0.048

There is significant dependency between OR5 and OP4 in the teaching of basic mathematics with a P-value of 0.048

Domain OR5 is our department has adequate financial resources for its operations while OP4 is our Mathematics department enjoys a high level of employee job satisfaction.

From those who strongly disagree for OR5, 10.9% strongly agree, 9.1% agree and 7.3% disagree with OP4. Of the participants who disagree with OR5, 32.7% strongly agree, 12.7% agree and 0.0% disagree with OP4. The ones who agree for OR5, 20.0% strongly agree, 5.5% agree and 1.8% disagree for OP4.

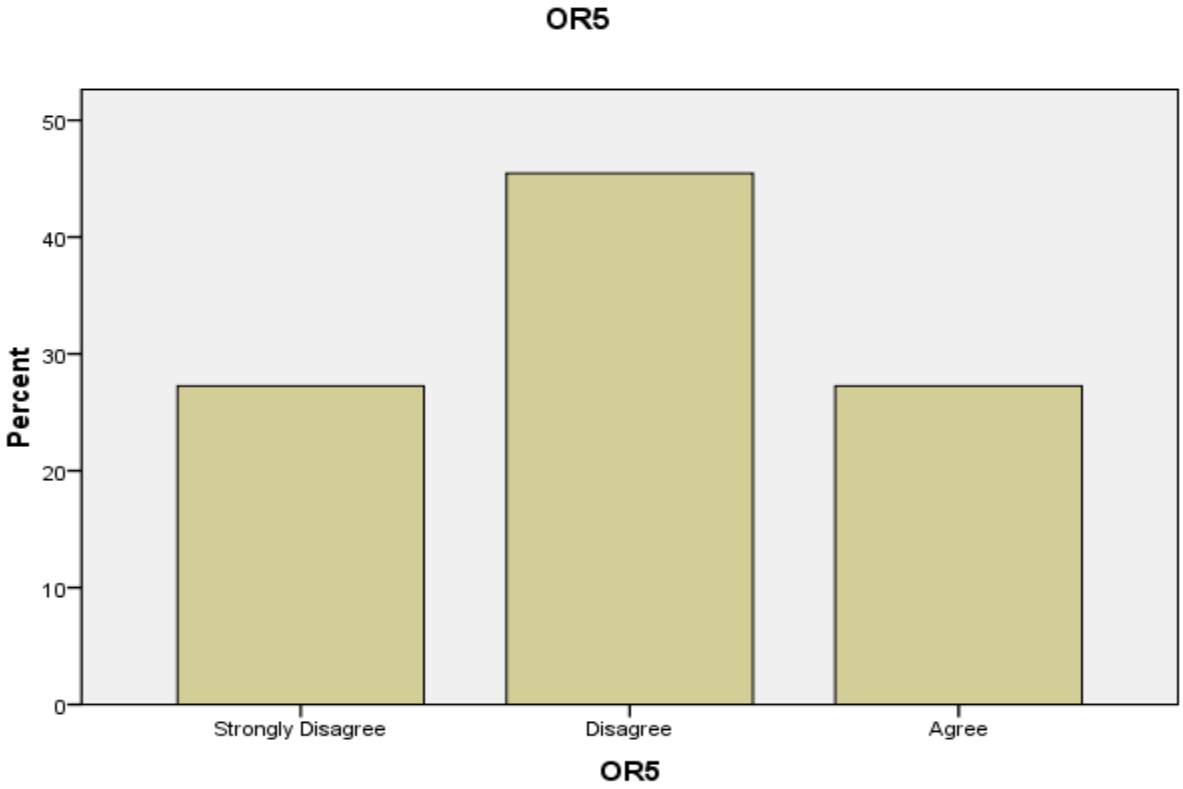

Figure 4.21: Organizational Resources, OR5

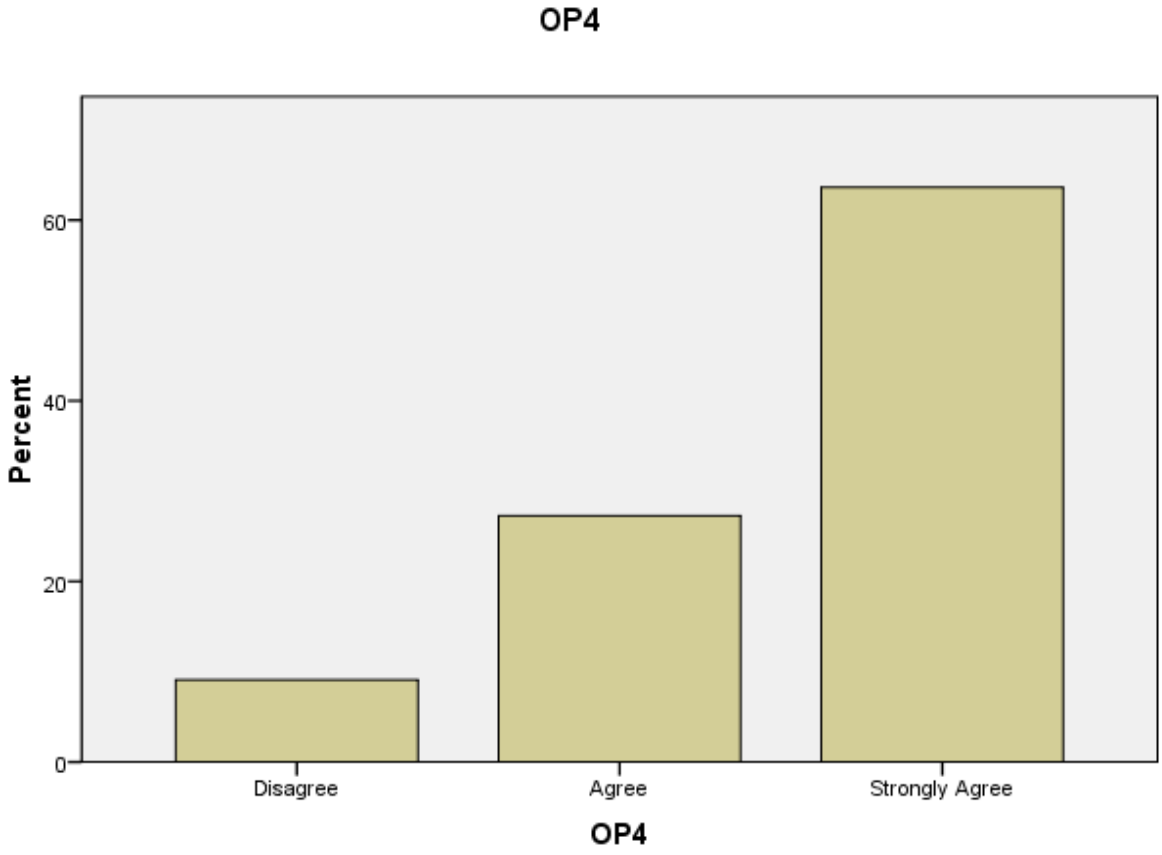

Figure 4.22: Organizational Performance, OP4

From table 4.11; graph 4.21 and 4.22 above, it shows that for OR5, 27.3% strongly disagree, 45.5% disagree, 27.3% agree respectively. It can be noted that 63.6% strongly agree, 27.3% agree and 9.1% disagree for the OP4.

OR5 - our department has adequate financial resources for its operations. With regards to domain OR5, 27.3% strongly disagree and 45.5% disagree. This indicates that there is inadequate financial resource in the department for its operations. Inadequate teaching and learning resources can be a challenge in learning institutions. The cost of buying these teaching and learning materials is often very high. In this regard, organizational resource can be physical and non-physical assets. Tangible resources (physical) and financial assets consist of land, furniture, capital and machinery while

intangible resources include knowledge, skills, processes, brand name, organizations reputation as well as employees experience (Jugdev & Mathur, 2012).

OP4 - our Mathematics department enjoys a high level of employee job satisfaction. The results shows that 63.6% strongly agree, 27.3% agree that mathematics department enjoys a high level of employee job satisfaction. Teaching in is a very demanding and sometimes stressful job and this may result in reduced commitment to the organization (Musaazi, 1982). This was seconded by Putti, Aryee and Liang (1989), who stated that, employees emotional attachment to the organization has a significant impact on work-relevant behaviors such as performance and absenteeism. These employees are likely to be inspired and become highly committed when there is a bond between the organization and their work. Employees' willingness to contribute to the organizational goals can be referred to as organizational commitment (Ismail, 2012). Employees need to be assured of their own growth within the organization. When the university meet it's employees expectations, they get satisfied and committed to their jobs. Satisfied employees remain committed to their jobs. When lecturers develop good feelings towards their job they can speak highly of the organization to their friends. Job satisfaction leads to organizational commitment which will establish a positive feeling of belonging in employees.

Table 4.12: The dependency of Organizational Resources, OR6 and Organizational Performance, OP5 (by OR6 and OP5) in the teaching of Basic Mathematics

Crosstab of OR6 and OP5

			OP5			
			Disagree	Agree	Strongly Agree	Total
OR6	Disagree	Count	0	11	19	30
		% of Total	.0%	20.0%	34.5%	54.5%
	Agree	Count	1	16	8	25
		% of Total	1.8%	29.1%	14.5%	45.5%
Total		Count	1	27	27	55
		% of Total	1.8%	49.1%	49.1%	100.0%

FET:P=0.040

There is significant dependency between OR6 and OP5 in the teaching of basic mathematics with a P-value of 0.040

Domain OR6 - we have adequate tools for our operations while OP5 is our department has adequate capacity to react appropriately and expeditiously to change.

From those who disagree for OR6, 34.5% strongly agree, 20.0% agree and 0.0% (none) disagree with OP5. Of the participants who agree with OR6, 14.5% strongly agree, 29.1% agree and 1.8% disagree with OP5.

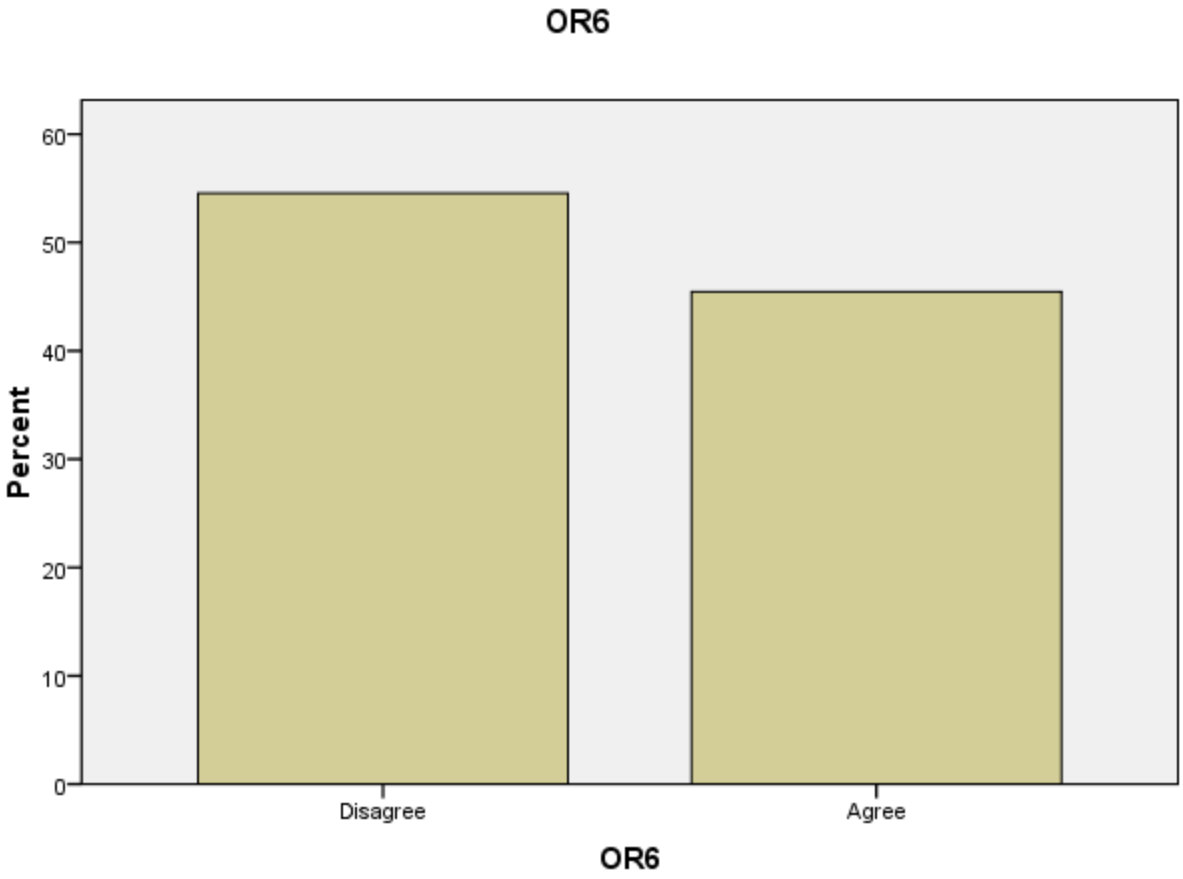

Figure 4.23: Organizational Resources, OR6

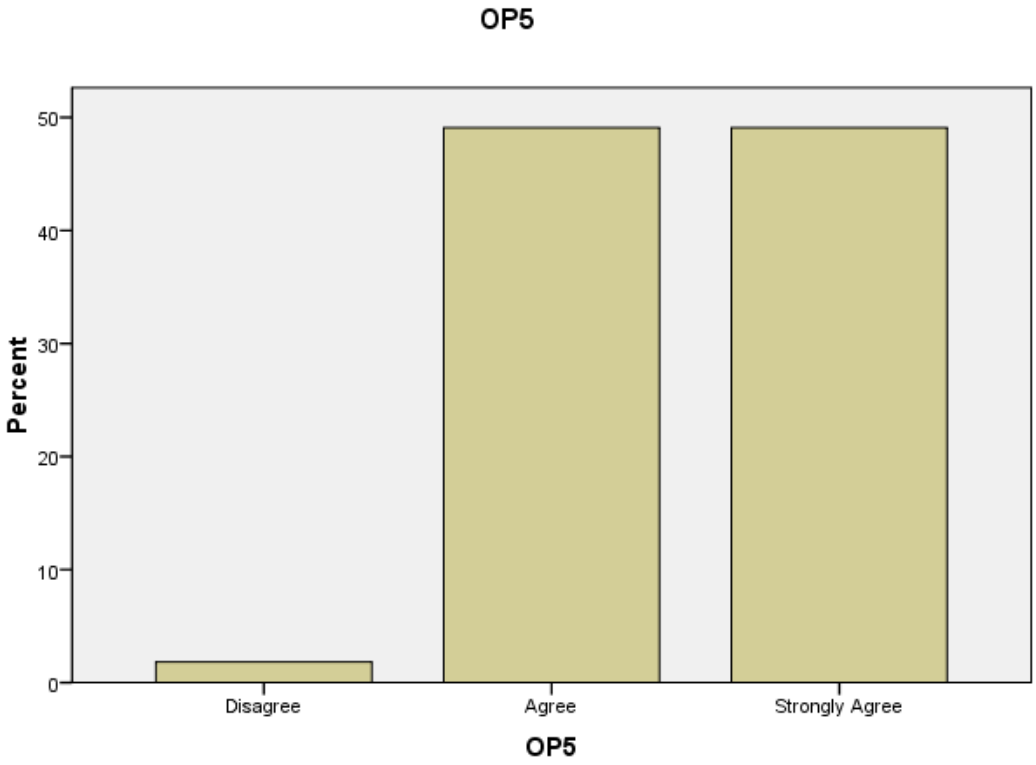

Figure 4.24: Organizational Performance, OP5

From table 4.12; graph 4.23 and 4.24 above, it shows that for OR6, 54.5% disagree and 45.5% agree respectively. It can be noted that 49.1% strongly agree, 49.1% agree and 1.8% disagree for the OP5.

Domain OR6 – we have adequate tools for our operations. Of the respondents 54.5% strongly disagree that the department have adequate tools for our operations. Without proper adequate resources or tools, companies would fail to achieve high level of efficiency and competent workforce.

Ahangar (2011) stated that physical assets are weak competitive assets as they can easily be copied or replicated by other competitors in the market in comparison to non- physical assets. Implied in the above is that, organizations serves as source of financial, informational, physical, technological and material resources.

Domain OP5 – Our department has adequate capacity to react appropriately and expeditiously to change. With regards to OP5 – our department has adequate capacity to react appropriately and expeditiously to change. Majority strongly agree (49.1%) and agree (49.1%) that the department react appropriately to change, which is a good culture. Skilful and capable lectures will be able to handgrip change expeditiously and view change in a positive light that promotes problems into opportunities. In an educational setting organizational performance is perceived as the extent to which the educational institution meets its organizational objectives and set goals i.e. making students pass and be absorbed into the job market or industry (Abdi & Williams, 2013).

Table 4.13: The dependency of Organizational Commitment, OC6 and Organizational Performance, OP4 (by OC6 and OP4) in the teaching of Basic Mathematics

Crosstab of OC6 and OP4

			OP4			
			Disagree	Agree	Strongly Agree	Total
OC6	Strongly Disagree	Count	0	1	0	1
		% of Total	.0%	1.8%	.0%	1.8%
	Agree	Count	0	6	4	10
		% of Total	.0%	10.9%	7.3%	18.2%
	Strongly Agree	Count	5	8	31	44
		% of Total	9.1%	14.5%	56.4%	80.0%
Total		Count	5	15	35	55
		% of Total	9.1%	27.3%	63.6%	100.0%

FET:P=0.022

There is significant dependency between OC6 and OP4 in the teaching of basic mathematics with a P-value of 0.022

Domain OC6 - for me this is the best of all possible organizations for which to work while OP4 is Our mathematics department enjoys a high level of employee job satisfaction.

From those who disagree for OC6, 0.0% (none) strongly agree, 1.8% agree and 0.0% (none) disagree with OP4. Of the participants who agree with OC6, 7.3% strongly agree, 10.9% agree and 0.0% (none) disagree with OP4. The participants who strongly agree for OC6, 56.4% strongly agree, 14.5% agree and 9.1% disagree for OP4.

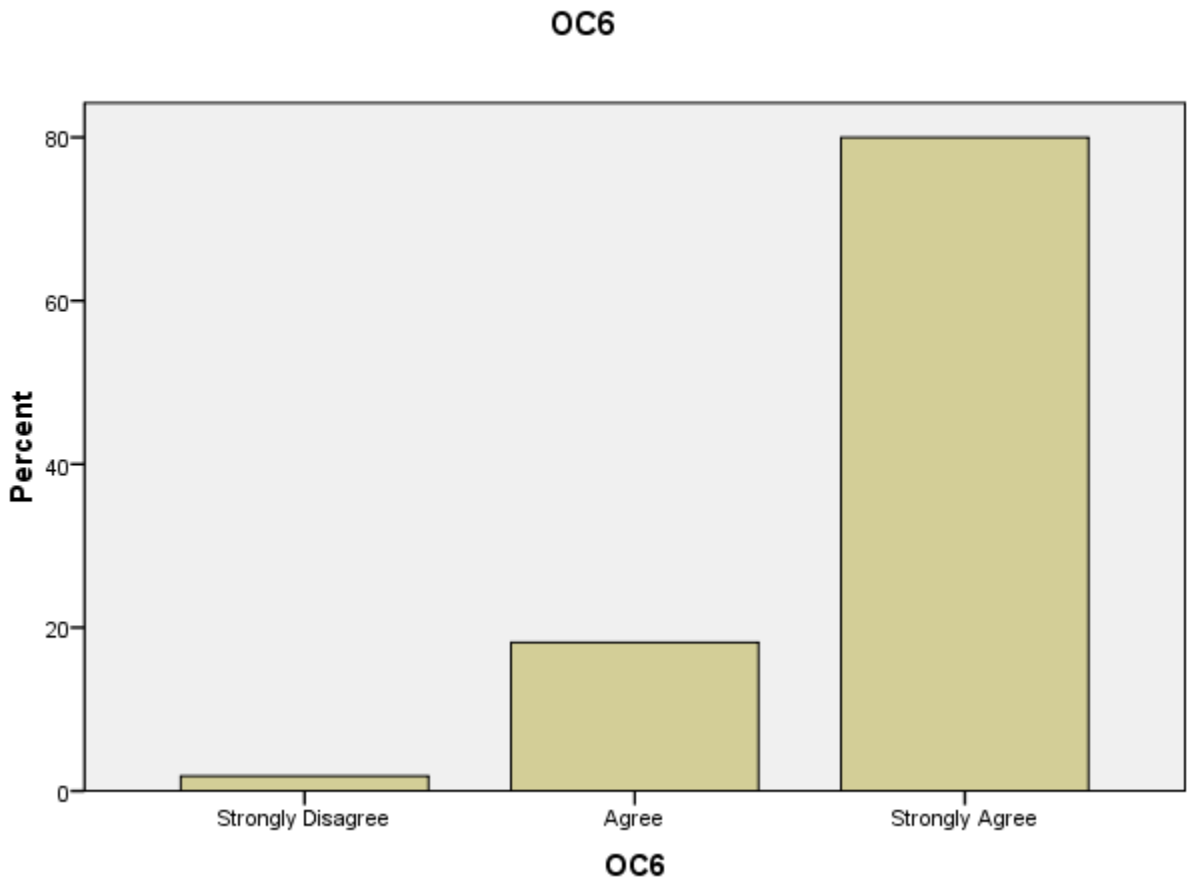

Figure 4.25: Organizational Commitment, OC6

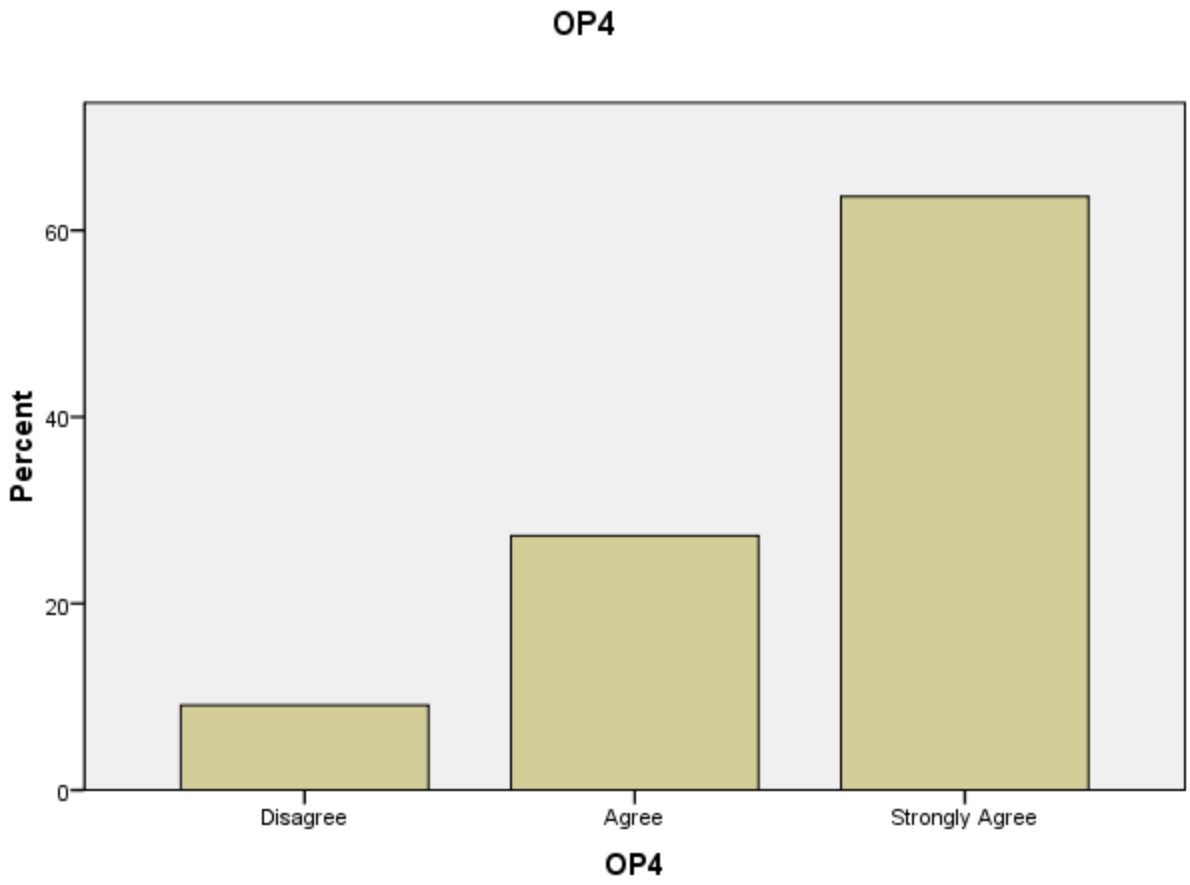

Figure 4.26: Organizational Performance, OP4

From table 4.13; graph 4.25 and 4.26 above, it shows that for OC6, 1.8% strongly disagree, 18.2% agree, 80.0% strongly agree respectively. It can be noted that 63.6% strongly agree, 27.3% agree and 9.1% disagree for the OP4.

Domain OC6 – for me this is the best of all possible organizations for which to work. Most of the lecturers strongly agree (80.0%) and agree (18.2%) that the University of Namibia is the best institution to work for.

OP4 - our Mathematics department enjoys a high level of employee job satisfaction. The results shows that 63.6% strongly agree, 27.3% agree that mathematics department enjoys a high level of

employee job satisfaction. Teaching in is a very demanding and sometimes stressful job and this may result in reduced commitment to the organization (Musaazi, 1982). The results concur with Putti, Aryee and Liang (1989), who stated that, employees emotional attachment to the organization has a significant impact on work-relevant behaviors such as performance and absenteeism. These employees are likely to be inspired and become highly committed when there is a bond between the organization and their work. Employees' willingness to contribute to the organizational goals can be referred to as organizational commitment (Ismail, 2012). Employees need to be assured of their own growth within the organization. When the university meet it's employees expectations, they get satisfied and committed to their jobs. Satisfied employees remain committed to their jobs. When lecturers develop good feelings towards their job they can speak highly of the organization to their friends. Job satisfaction leads to organizational commitment which will establish a positive feeling of belonging in employees.

Table 4.14: The dependency of Organizational Commitment, OC6 and Organizational Performance, OP4 (by OC6 and OP4) in the teaching of Basic Mathematics

Crosstab of OC10 and OP3

			OP3		
			Agree	Strongly Agree	Total
OC10	Agree	Count	6	9	15
		% of Total	10.9%	16.4%	27.3%
	Strongly Agree	Count	4	36	40
		% of Total	7.3%	65.5%	72.7%
Total		Count	10	45	55
		% of Total	18.2%	81.8%	100.0%

FET:P=0.018

There is significant dependency between OC10 and OP3 in the teaching of basic mathematics with a P-value of 0.018

Domain OC10 is I work in a well – managed University while OP3 is the work atmosphere (integration, commitment and cohesion) is very good.

From those whoagree for OC10, 16.4% strongly agree and 10.9% agree with OP3. Of the participants who strongly agree with OC10, 65.5% strongly agree, 7.3% agree with OP3.

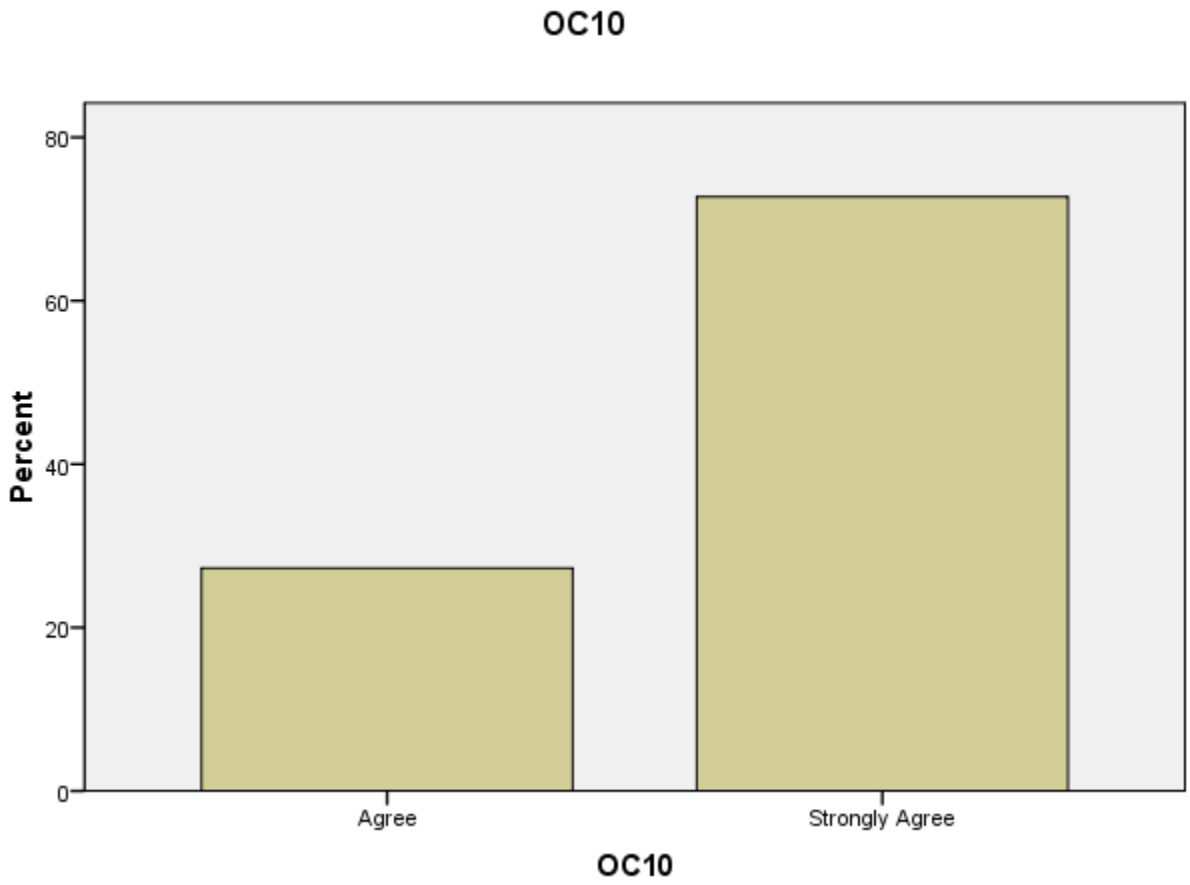

Figure 4.27: Organizational Commitment, OC10

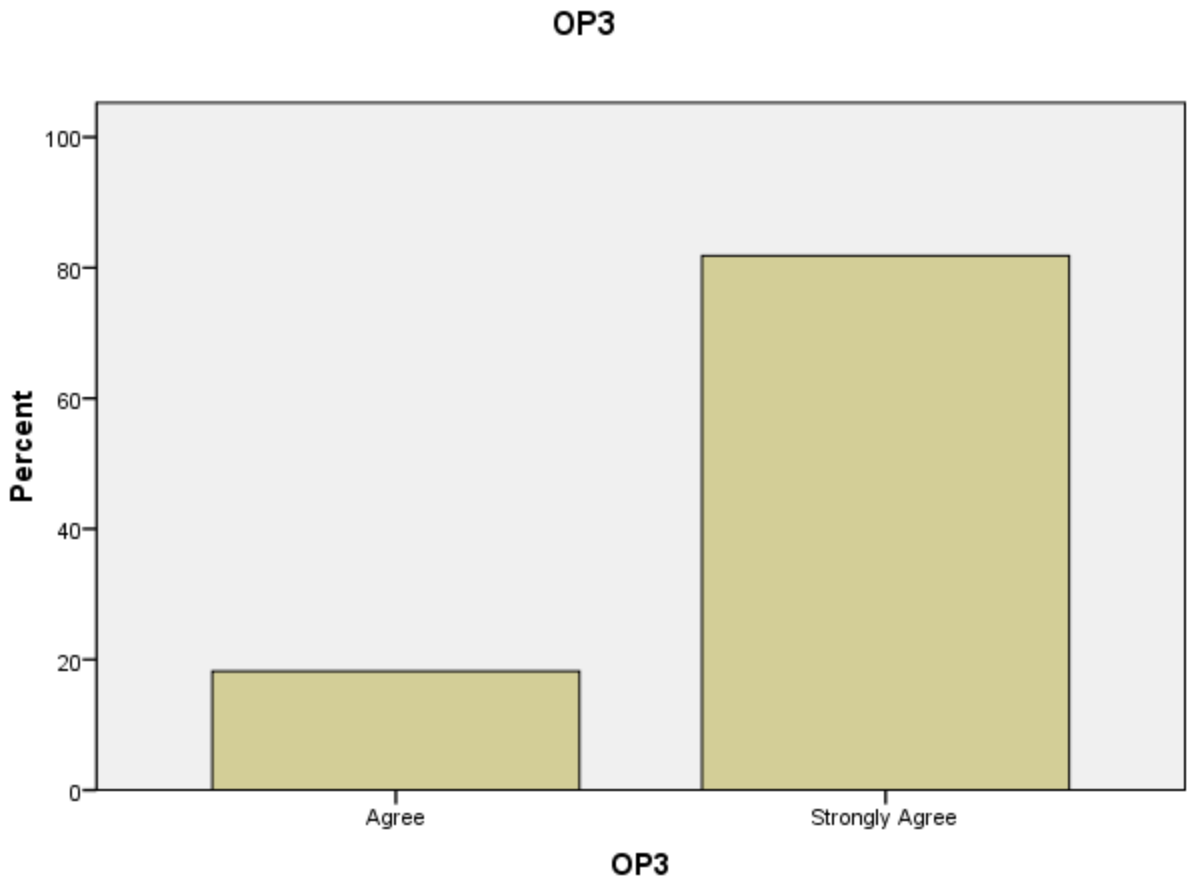

Figure 4.28: Organizational Performance, OP3

From table 4.14; graph 4.27 and 4.28 above, it shows that for OC10, 27.3% agree and 72.7% strongly agree respectively. It can be noted that 81.8% strongly agree and 18.2% agree for the OP3.

Domain OC10 – I work in a well – managed university. All the lecturers answered strongly agree (72.7%) and agree (27.3%) that they work in a well-managed university. The University of Namibia is one of the popular universities in Namibia.

OP3 - is the work atmosphere (integration, commitment and cohesion) is very good. The result indicates that 81.8% strongly agree and 18.2% agree that the work atmosphere is very good. Needless to say an organizational success depends greatly on the willingness of the human

resources to accomplish the purpose to which the organization is in existence hence devotion and commitment matter the most.

Table 4.15: Cronbach Alpha Value

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.575	.504	38

The Cronbach Alpha value is $\alpha = 0.575$

According to Hinton, Brownlow, McMurray and Cozen (2004:364), the appropriate cut-off points for reliability are:

0.90 and above shows excellent reliability;

0.70 to 0.90 shows high reliability;

0.50 to 0.70 shows moderate reliability;

0.50 and below shows low reliability.

The reliability of this questionnaire is measured at $\alpha = 0.575$

This means that the questionnaire was moderately reliable.

4.4 Findings from open ended questions

The respondents had to answer two open ended questions on the questionnaire which are:

Ouestion 1

Out of all the domains and subdomains which have been highlighted in this study, which ones do you strongly feel need to be attended to as a matter of urgency?

This is what lecturers had to say.

Organizational processes on P9

- *The current high school mathematics Curricula is appropriate in preparing students for tertiary level - P9*

Organizational Resource on OR4, OR5 and OR6

- *All positions within the Mathematics department are adequately and appropriately staffed – OR4*
- *Our department has adequate financial resources for its operations – OR5*
- *We have adequate tools for our operations – OR6*

The majority of the respondents strongly highlighted the two domains Organizational Processes and Organizational Resources as the main ones that need to be attended to as a matter of urgency.

Lecturers considered the current high school mathematics curricula inappropriate in preparing students for tertiary level (P9) to be the most important aspect that need attention. The high school curriculum is divorced from the University one. Hence students find it very difficult to bridge the gap as the curriculum lacks basic concepts. It can be noted that 76.4% strongly disagree, 21.8% disagree and 1.8% agree for the P9 from the crosstabs of closed ended questions. There are similarities between the two questions.

It can be concluded that the majority of respondents do not support the high school curriculum. The findings concur with literature, as Miranda et al. (2013;10) unearthed that, the Namibian school mathematics curriculum (National Secondary School Certificate – NSSC) does not prepare learners with necessary basic mathematics skills for year one university mathematics students' as

most content that is supposed to be taught is not covered in the (NSSC – curriculum) (MINISTRY OF EDUCATION,2007,2010). This can be one of the contributing factors to poor performance in mathematics at the University of Namibia." It can be concluded that High school curriculum need to be reviewed.

As of the second domain Organizational Resource on OR4, OR5 and OR6

- All positions within the Mathematics department are adequately and appropriately staffed – OR4

Lectures pointed out that they have very large classes and students should be adequately handled by the lecturer which is difficult. They recommend urgent recruitment of lecturers. Similarities can be draw from the closed ended and open ended questions. From the closed ended questions the result indicates that 36.4% strongly disagree and 61.8% disagree that all positions within the Mathematics department are adequately and appropriately staffed. Shortage of staff may affect teaching, learning and performance as lecturers may be are overloaded.

- Our department has adequate financial resources for its operations – OR5

Lecturers indicated that financial resources seem limited. With regards to domain OR5 from the closed ended questions, 27.3% answered strongly disagree and 45.5% disagree. This indicates that there is inadequate financial resource in the department for its operations. Therefore there is dependency between the closed and open ended questions.

- We have adequate tools for our operations – OR6

With regards to tools for operations, lectures indicated that there is lack of infrastructure like printers, computers etc. Of the respondents 54.5% strongly disagree that the department have adequate tools for our operations. Resources help to accomplish the organizations aims and objectives. It's therefore crucial to have enough tools for effectiveness. Similarly, there is correlation between the closed and open ended questions.

Question 2

What recommendations can you suggest to try and mitigate the above challenges?

The following were the lecturers' responses:

- *The Ministry of Basic Education, Arts and Culture should review the high school mathematics curriculum to the first year university Basic Mathematics. This will address the lack of mathematics content knowledge in grade 12 learners.*
- *The Ministry of Basic Education, Arts and culture should make sure that the primary teachers are well trained and lay in turn a solid foundation to learners from primary school.*
- *The Mathematics department at the University of Namibia should work with the Ministry of Basic Education, Arts and Culture so that there is a continuous flow of concepts from primary and secondary education to tertiary level.*
- *The University should invest more money in Mathematics department to have all the resources required (materials and financial, facilities and human resource.*
- *More recruitment is needed in the department.*
- *More training is needed for the University to achieve the required performance.*

All the recommendations raised are related to some of the statements which were rated strongly disagree and disagree in the closed and open ended questions. There is a relationship between the closed and open ended responses from the respondents which validates the questionnaire. Since, qualitative data supports quantitative data, this form a Triangulation.

4.5 Summary

This chapter presented the findings of the study. The study findings were presented in the form of organizational domains which were aligned to answer the research questions of the study. The study revealed that the University is not doing well in the Organisational Resources. However, the Ministry of Basic Education Arts and Culture need to improve its High School Mathematics Curriculum to bridge the gap between the high school curriculum and tertiary level.

Chapter 5 CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the study, the conclusions, recommendations and areas for further research. The main purpose and aim of the study was to investigate the Organizational complexity of the offering of mathematics education at a Namibian tertiary institution. The study used a mixed research methodology and designs through the use of a closed ended and open ended questionnaire which was administered to 55 purposefully selected lectures for mathematics at a tertiary institution in Namibia. The study sort to answer three main research questions which were*: What is the impact of organizational processes, lecturers' skills development, organizational resources, and lecturers' organizational commitment on organizational performance in the Mathematics Department at the University of Namibia?* With the following sub questions:

(1) What is the impact of the organizational processes on organizational performance in the teaching of Basic Mathematics at the University of Namibia? (2) What is the link between lecturers' skills development and the organizational performance in the teaching of Basic Mathematics at the University of Namibia? (3) What is the impact of organizational resources on the organizational performance in the teaching of Basic Mathematics at the University of Namibia? (4) How can the organizational processes and performance in the teaching of Basic Mathematics at the University of Namibia be improved?

All the questions were answered in Chapter 4 where research findings were presented and disparagingly discussed.The collected data was analysed and elaborated on in Chapter Four. Literature and the theoretical Framework to substantiate, explain, relate and contrast the findings of this study. A brief summary on each of the preceding chapters, as well as conclusions and recommendations from the findings will be presented in the following sections.

5.2 Summary of the chapters

The summary of the chapters provides a brief account of the presented chapters without necessarily giving full details since the details have already been discussed in their respective chapters.

5.2.1. Chapter 1: Introduction of the study.

This chapter detailed the background of the problem, the problem statement, the aim of the study and the objectives. The problem identified in the statement of the problem is poor performance of first year Basic Mathematics at the University of Namibia. The significance of the study is discussed in this chapter, which indicates that the study will help the educational policy makers especially the Ministry of Basic Education and Culture to develop better Mathematics curriculum which will prepare students for tertiary level. It will help the University of Namibia management improve the organizational resources domain for better performance.

5.2.2. Chapter 2: Literature Review

The second chapter presented the theoretical framework of the study and a comprehensive review of literature for the study. In this chapter, the reviewed literature focused mainly on organizational processes, organizational resources, skills development, organizational commitment and their effect on organizational performance from the perspective of a tertiary institution.

5.2.3. Chapter 3: Research methodology

The study participants were Mathematics lecturers selected purposefully from all the campuses of the University of Namibia offering Basic Mathematics. A purposeful sampling strategy was used to select 55 lecturers of Mathematics to whom structured questionnaires were personally administered. Data was collected by means of a self-administered closed and open ended questionnaire.

5.2.4. Chapter 4: Presentation and discussion of the findings

The chapter dealt with the presentation and discussion of data acquired from the questionnaires administered on the Organizational complexity of the offering of Basic Mathematics at a Namibian tertiary institution. Specifically, this study revealed that organizational processes and organizational resources are the main domains which seem to be contributing to the foregoing poor

performances being experienced at the University of Namibia. The study revealed that lecturer's skills development and organizational commitment are sufficient at the University of Namibia and are not the ones that can be blamed for the poor performance being experienced in the mathematics department at the University of Namibia. Organizational processes and organizational resources are the two main domains that need to be improved.

5.2.5 Chapter 5: Conclusions and Recommendations

This chapter presents the conclusions and recommendations of the study. It also presents an overall summary of the chapters covered in the study, as well as the limitations that need to be observed simultaneously with the findings of the study. The chapter also provides recommendations for future research.

5.3 Summary of main findings

The respondents who participated in the survey were female, 42% whilst 58% were male, representing 100% response rate.

Majority of the lecturers are masters degree holders 28 (51%), followed by Hons degree – first degree18 (33 %) and PhD (Doctrate degree) 9(16%). Most of these lecturers are furthering their studies for personal and organizational growth. Majority of the participants have 10 – 19 years of experience and the least years of experience is 5 years.

Furthermore, lecturers strongly agree with Skills Development domain, that lecturers get exposure to contemporary mathematics teaching methods.

Most of the participants strongly disagree that all positions within the department are adequately and appropriately staffed, and that the department does not have enough financial resources and tools for operations.

Majority strongly agree that the department reacts timeously to change.

Of the respondents, 49.1% and 40.0% agree and strongly agree respectively that the Science Foundation Programme is very effective. The department fully supports the Science Foundation Program because it closes the gap between high school and tertiary curriculum.

The figures show that 63.6% of the respondents strongly disagree that lecturers get adequate exposure to contemporary maths teaching methods.

Respondents (63.6%) strongly agree that the University of Namibia has a good reputation for education/ service delivery.

The result shows that 76.4% and 21.8% strongly disagree and disagree respectively that the current High School Mathematics curricula is appropriate in preparing students for tertiary level.

Furthermore, 9.1% strongly disagree and 78.2% disagree with domain SD2 (Training support for relevant personnel is available).

As of domain P2 – work procedures and objectives are well documented in our department; participants strongly agree (47.3%) and agree (34.5%) that the work procedures and objectives are well documented in the department.

Majority of the respondents strongly agree (54.5%) and agree (40.0%) that lecturers know the key skills the department needs in the next five years.

With regards to OP5 – our department has adequate capacity to react appropriately and expeditiously to change. Majority strongly agree (49.1%) and agree (49.1%) that the department reacts appropriately to change.

Our internal strength is adequate (financial resources, physical assets and materials; and quality and diversity of staff) of which 23.6% and 38.2% strongly agree and agree respectively.

Most of the respondents strongly agree 50.9%, 45.5% agree that our personnel are highly capable in multiple roles and committed to mission, strategy, and continuous learning.

There is a need for more lecturers as the results show that, 72.7% agree and 27.3% strongly agree that adequate lecturers and processes enhance effectiveness. The result indicates that 36.4% strongly disagree and 61.8% disagree that all positions within the Mathematics department are adequately and appropriately staffed.

Our department has adequate financial resources for its operations. With regards to this domain, 27.3% strongly disagree and 45.5% disagree.

Moreover, the results shows that 63.6% strongly agree, 27.3% agree that mathematics department enjoys a high level of employee job satisfaction.

Of the respondents, 54.5% strongly disagree that the department have adequate tools for operations. Most of the lecturers strongly agree (80.0%) and agree (18.2%) that the University of Namibia is the best institution to work for.

All lecturers strongly agree (72.7%) and agree (27.3%) that they work in a well-managed university. The result indicates that 81.8% strongly agree and 18.2% agree that the work atmosphere is very good.

From these findings, it can be concluded that the University of Namibia is generally doing well in most of the aspects or domain discussed in this study such as Organizational Commitment, Skills Development and Organizational Performance. However, there is a need to improve on Organizational Resources and organizational processes.

The reliability of this questionnaire was measured at $\alpha = 0.575$

This means that the questionnaire was moderately reliable

5.4 Limitations of the Study

All the participants in the study were Mathematics lecturers at the University of Namibia. The initial plan was to administer the questionnaire only to Basic Mathematics lecturers, but their numbers could not reach the quantity which the researcher wanted. Therefore, the researcher had to engage any other Mathematics lecturer who at one point has taught Basic Mathematics at the University of Namibia. The researcher also experienced the challenge of time and money since the seven visited campuses are far apart.

5.5 Recommendations

5.5.1 Recommendations to the University of Namibia

The study recommends that:

The Mathematics department at the University of Namibia should work with the Ministry of Basic Education, Arts and Culture to ensure a continuous flow of concepts from primary and secondary education to tertiary level.

The University should invest more money in Mathematics department to have all the resources required.

More recruitment is needed in the Mathematics department.

More staff (lecturer) training is needed for performance enhancement.

5.5.2 Recommendation to the Ministry of Education Arts and Culture

The Ministry of Basic Education, Arts and Culture should review the high school mathematics curriculum to close the gap between high school and tertiary curriculum.

5.6 Suggestions for further research

There is a need for further studies to concentrate on high school curriculum improvement in order to close the gap between high school and tertiary curriculum.

5.7 Conclusion

This chapter presents the summary of the chapters in the study, followed by a summary of the main findings emanating from the study. It also presented recommendations and areas for further research.

Mixed (quantitative and qualitative) research approach was used to answer the research questions in this study, thereby attaining the research goals and the pre-set objectives of the study. The results of this study provided insight into the organizational complexity of the offering of Basic Mathematics at a Namibian tertiary institution. This last chapter of the study provides the reader with a summary of the findings and the conclusions of the preceding chapters, from the introduction, literature review, applied methodology and the presentation of the research findings.

A number of recommendations were made to the University of Namibia Management and the Ministry of Basic Education Arts and Culture based on these results. In addition, the researcher

made suggestions for future research. In conclusion, the study is expected to add new knowledge to a limited body of literature on Organizational complexity of the offering of Basic Mathematics at a Namibian tertiary institution in the Namibian context.

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APPENDIX A: QUESTIONNAIRE

A Study of the Organizational Complexity of the Offering of Mathematics Education at a Namibian Tertiary Institution

The aim of this research is to deepen the body of knowledge in the area of Science education by assessing the main determinants of performance in the Mathematics Department at the University of Namibia and - in so doing – serve as a guiding instrument for educational policy-makers and all other relevant stakeholders for the development of enhanced policies and programmes with regards to Mathematics education in the Namibian tertiary institutions. This research forms part of the requirements for the Degree of Master in Education at the Stellenbosch University. Your responses will be treated as confidential and the information will not be used for commercial purposes or any other purpose.

Section A: Biographical Information

Mark with **(x)** the appropriate box:

Gender

1	Male	1
	Females	2

Qualification

2	Honours Degree	1
	Master's Degree	2
	Doctorate Degree & others	3

Teaching experience

3	<5years	1
	5-8 years	2
	9-11 years	3

	>11 years	4

Section B: Questions on the organisational processes of Basic Mathematics teaching and administration

For each of the statements below, please rate your answer and mark with (x) the appropriate box as follows:

Strongly disagree (1); Disagree (2); Disagree moderately (3); Agree moderately (4); Agree (5); Strongly agree (6)

There are no "right or wrong" answers to these questions; so please be as honest and thoughtful as possible in your responses. All responses will be kept strictly confidential.

		1	2	3	4	5	6
Organizational Processes							
P1	The Mathematics Department at the University of Namibia have standardized procedures and policies.						
P2	Work procedures and objectives are well documented in the Mathematics Department at the University of Namibia.						
P3	The Mathematics Department at the University of Namibia revamps its teaching practices according to current needs.						
P4	The teaching activities in the Mathematics Department at the University of Namibia are more proactive than reactive in nature.						
P5	The Mathematics Department's processes are defined such that they will be in the same way by different work groups.						
P6	In the Mathematics Department at the University of Namibia, we constantly pilot with new ideas to improve our educational processes.						
P7	The Mathematics Department has an appropriate curriculum for Mathematics.						
P8	The Science Foundation Programme is very effective.						

P9	The Current High School Mathematics Curricula is appropriate in preparing students for tertiary level.						
Skills Development							
SD1	Lecturers get adequate exposure to contemporary maths teaching methods						
SD2	Training support for relevant personnel is available.						
SD3	Employees have the opportunity for career development within the Mathematics Department at University of Namibia.						
SD4	In the Mathematics Department at the University of Namibia, there are opportunities for employees to cross-train and learn new skills.						
SD5	Training and development opportunities are explicitly linked to the strategic direction of the Mathematics Department at University of Namibia.						
SD6	Lecturers know what the key skills are that Mathematics Department at the University of Namibia needs in the next five years.						
Organizational Resources							
OR1	The Mathematics Department at the University of Namibia has sufficient adequately trained and skilled personnel.						
OR2	Mathematics Department's personnel have diverse experiences with a broad range of skills.						
OR3	The Mathematics Department's personnel are highly capable and committed to mission, strategy, and continuous learning.						
OR4	All positions within the Mathematics department are adequately and appropriately staffed.						
OR5	The Mathematics department has adequate financial resources for its operations.						
OR6	The Mathematics department has adequate teaching tools/materials/equipment.						
Organizational Commitment							

OC1	I tell my friends this is a good organization to work for.						
OC2	I would accept almost any type of job assignment in order to keep working for the Mathematics Department at University of Namibia.						
OC3	I find that my values and the University's values are very similar.						
OC4	I am proud to tell others that I am part of the Mathematics Department at University of Namibia.						
OC5	I am willing to put in a great deal of extra effort to help the Mathematics Department at University of Namibia be successful.						
OC6	For me, the Mathematics Department at University of Namibia is the best of all possible departments/organizations for which to work.						
OC7	I speak highly of the Mathematics Department to my friends.						
OC8	I am proud to be part of the Mathematics department in this University.						
OC9	The Mathematics Department at University of Namibia inspires the best job performance from me.						
OC10	I work in a well-managed department.						
Organizational Performance							
OP1	The Mathematics Department's educational goals, quality of education, cost-effectiveness, and performance are often commendable.						
OP2	The Mathematics Department's effectiveness is always ensured by adequate lecturers and processes.						
OP3	In Mathematics Department at University of Namibia, the work atmosphere (integration, commitment and cohesion) is very good.						
OP4	Our Mathematics department enjoys a high level of employee job satisfaction.						
OP5	Our Mathematics Department has adequate capacity to react appropriately and expeditiously to change.						
OP6	Our Mathematics Department's internal strength is adequate (financial resources, physical assets and materials; and quality and diversity of staff).						

OP7	The Mathematics Department at University of Namibia has a good reputation for education/service delivery.						
OP8	The Mathematics Department at University of Namibia enjoys a high level of stakeholders' satisfaction.						

Section C: Recommendations

1. Out of all the domains and sub domains which have been highlighted in this study, which ones do you strongly feel need to attended to as a matter of urgency?

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2. What recommendations can you suggest to try and mitigate the above challenges?

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APPENDIX B: FREQUENCY TABLE

Frequency Table

P1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	4	7.3	7.3	7.3
	Disagree	14	25.5	25.5	32.7
	Agree	30	54.5	54.5	87.3
	Strongly Agree	7	12.7	12.7	100.0
	Total	55	100.0	100.0	

P2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	3.6	3.6	3.6
	Disagree	8	14.5	14.5	18.2
	Agree	19	34.5	34.5	52.7
	Strongly Agree	26	47.3	47.3	100.0
	Total	55	100.0	100.0	

P3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.8	1.8	1.8
	Disagree	7	12.7	12.7	14.5
	Agree	44	80.0	80.0	94.5
	Strongly Agree	3	5.5	5.5	100.0
	Total	55	100.0	100.0	

P4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	5.5	5.5	5.5
	Disagree	4	7.3	7.3	12.7
	Agree	32	58.2	58.2	70.9
	Strongly Agree	16	29.1	29.1	100.0
	Total	55	100.0	100.0	

P5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.8	1.8	1.8
	Disagree	6	10.9	10.9	12.7
	Agree	35	63.6	63.6	76.4
	Strongly Agree	13	23.6	23.6	100.0
	Total	55	100.0	100.0	

P6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	22	40.0	40.0	40.0
	Disagree	12	21.8	21.8	61.8
	Agree	21	38.2	38.2	100.0
	Total	55	100.0	100.0	

P7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	4	7.3	7.3	7.3
	Agree	21	38.2	38.2	45.5
	Strongly Agree	30	54.5	54.5	100.0
	Total	55	100.0	100.0	

P8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	3.6	3.6	3.6
	Disagree	4	7.3	7.3	10.9
	Agree	27	49.1	49.1	60.0
	Strongly Agree	22	40.0	40.0	100.0
	Total	55	100.0	100.0	

P9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	42	76.4	76.4	76.4
	Disagree	12	21.8	21.8	98.2
	Agree	1	1.8	1.8	100.0
	Total	55	100.0	100.0	

SD1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	35	63.6	63.6	63.6
	Disagree	20	36.4	36.4	100.0
	Total	55	100.0	100.0	

SD2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	9.1	9.1	9.1
	Disagree	43	78.2	78.2	87.3
	Agree	7	12.7	12.7	100.0
	Total	55	100.0	100.0	

SD3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	7	12.7	12.7	12.7
	Strongly Agree	48	87.3	87.3	100.0
	Total	55	100.0	100.0	

SD4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	3	5.5	5.5	5.5
	Strongly Agree	52	94.5	94.5	100.0
	Total	55	100.0	100.0	

SD5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	20	36.4	36.4	36.4
	Strongly Agree	35	63.6	63.6	100.0
	Total	55	100.0	100.0	

SD6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	3	5.5	5.5	5.5
	Agree	22	40.0	40.0	45.5
	Strongly Agree	30	54.5	54.5	100.0
	Total	55	100.0	100.0	

OR1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	55	100.0	100.0	100.0

OR2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	25	45.5	45.5	45.5
	Strongly Agree	30	54.5	54.5	100.0
	Total	55	100.0	100.0	

OR3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	3.6	3.6	3.6
	Agree	25	45.5	45.5	49.1
	Strongly Agree	28	50.9	50.9	100.0
	Total	55	100.0	100.0	

OR4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	20	36.4	36.4	36.4
	Disagree	34	61.8	61.8	98.2
	Agree	1	1.8	1.8	100.0
	Total	55	100.0	100.0	

OR5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	27.3	27.3	27.3
	Disagree	25	45.5	45.5	72.7
	Agree	15	27.3	27.3	100.0
	Total	55	100.0	100.0	

OR6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	30	54.5	54.5	54.5
	Agree	25	45.5	45.5	100.0
	Total	55	100.0	100.0	

OC1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	20	36.4	36.4	36.4
	Strongly Agree	35	63.6	63.6	100.0
	Total	55	100.0	100.0	

OC2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	35	63.6	63.6	63.6
	Disagree	15	27.3	27.3	90.9
	Agree	5	9.1	9.1	100.0
	Total	55	100.0	100.0	

OC3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	10	18.2	18.2	18.2
	Strongly Agree	45	81.8	81.8	100.0
	Total	55	100.0	100.0	

OC4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	26	47.3	47.3	47.3
	Strongly Agree	29	52.7	52.7	100.0
	Total	55	100.0	100.0	

OC5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	20	36.4	36.4	36.4
	Strongly Agree	35	63.6	63.6	100.0
	Total	55	100.0	100.0	

OC6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.8	1.8	1.8
	Agree	10	18.2	18.2	20.0
	Strongly Agree	44	80.0	80.0	100.0
	Total	55	100.0	100.0	

OC7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.8	1.8	1.8
	Agree	7	12.7	12.7	14.5
	Strongly Agree	47	85.5	85.5	100.0
	Total	55	100.0	100.0	

OC8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.8	1.8	1.8
	Agree	5	9.1	9.1	10.9
	Strongly Agree	49	89.1	89.1	100.0
	Total	55	100.0	100.0	

OC9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	17	30.9	30.9	30.9
	Strongly Agree	38	69.1	69.1	100.0
	Total	55	100.0	100.0	

OC10

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	15	27.3	27.3	27.3
	Strongly Agree	40	72.7	72.7	100.0
	Total	55	100.0	100.0	

OP1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	35	63.6	63.6	63.6
	Strongly Agree	20	36.4	36.4	100.0
	Total	55	100.0	100.0	

OP2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	40	72.7	72.7	72.7
	Strongly Agree	15	27.3	27.3	100.0
	Total	55	100.0	100.0	

OP3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	10	18.2	18.2	18.2
	Strongly Agree	45	81.8	81.8	100.0
	Total	55	100.0	100.0	

OP4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	5	9.1	9.1	9.1
	Agree	15	27.3	27.3	36.4
	Strongly Agree	35	63.6	63.6	100.0
	Total	55	100.0	100.0	

OP5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	1.8	1.8	1.8
	Agree	27	49.1	49.1	50.9
	Strongly Agree	27	49.1	49.1	100.0
	Total	55	100.0	100.0	

OP6

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	12.7	12.7	12.7
	Disagree	14	25.5	25.5	38.2
	Agree	21	38.2	38.2	76.4
	Strongly Agree	13	23.6	23.6	100.0
	Total	55	100.0	100.0	

OP7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	20	36.4	36.4	36.4
	Strongly Agree	35	63.6	63.6	100.0
	Total	55	100.0	100.0	

OP7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	20	36.4	36.4	36.4
	Strongly Agree	35	63.6	63.6	100.0
	Total	55	100.0	100.0	

OP8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	10	18.2	18.2	18.2
	Strongly Agree	45	81.8	81.8	100.0
	Total	55	100.0	100.0	

APPENDIX C: PERMISSION REQUEST LETTER

Permission letter to conduct a research

Sylvia Hatutale

P O BOX 1118

Oshakati

Namibia

25 July 2017

The Interim University Research Ethics Committee iUREC

University of Namibia

Windhoek

Dear sir/ madam

RE: Request for permission to conduct a research

My name is Sylvia Hatutale, a masters student in Education at the University of Stellenbosch.

My research project is entitled: *A Study of the Organizational Complexity of the Offering of Basic Mathematics at a Namibian Tertiary Institution.* This is in partial fulfilment for the award of the Degree of Master of Education.

I therefore ask permission to conduct a research in your organisation in order for me to get information related to my studies.

Your assistance in this regard is greatly appreciated.

Yours Faithfully

Sylvia Hatutale

(Researcher)

APPENDIX D: PERMISSION OFFER LETTER

UNAM
UNIVERSITY OF NAMIBIA

ETHICAL CLEARANCE CERTIFICATE

Ethical Clearance Reference Number: FOE/262/2017 **Date: 10 October, 2017**

This Ethical Clearance Certificate is issued by the University of Namibia Research Ethics Committee (UREC) in accordance with the University of Namibia's Research Ethics Policy and Guidelines. Ethical approval is given in respect of undertakings contained in the Research Project outlined below. This Certificate is issued on the recommendations of the ethical evaluation done by the Faculty/Centre/Campus Research & Publications Committee sitting with the Postgraduate Studies Committee.

Title of Project: A Study of the Organizational Complexity of the Offering of Mathematics Education at a Namibian Tertiary Institution

Researcher: Sylvia Hatutale

Faculty: Faculty of Education

Take note of the following:

(a) Any significant changes in the conditions or undertakings outlined in the approved Proposal must be communicated to the UREC. An application to make amendments may be necessary.
(b) Any breaches of ethical undertakings or practices that have an impact on ethical conduct of the research must be reported to the UREC.
(c) The Principal Researcher must report issues of ethical compliance to the UREC (through the Chairperson of the Faculty/Centre/Campus Research & Publications Committee) at the end of the Project or as may be requested by UREC.
(d) The UREC retains the right to:

(i) Withdraw or amend this Ethical Clearance if any unethical practices (as outlined in the Research Ethics Policy) have been detected or suspected,
(ii) Request for an ethical compliance report at any point during the course of the research.

UREC wishes you the best in your research.

Prof. P. Odonkor: UREC Chairperson

Ms. P. Claassen: UREC Secretary

APPENDIX E: INFORMED CONSENT FORM

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jou kennisvennoot • your knowledge partner

STELLENBOSCH UNIVERSITY
CONSENT TO PARTICIPATE IN RESEARCH

TITLE OF THE RESEARCH PROJECT: ***A Study of the Organizational Complexity of the Offering of Mathematics Education at a Namibian Tertiary Institution***

REFERENCE NUMBER: SU-HSD-004286

RESEARCHER: *HATUTALE SYLVIA*

ADDRESS: *Faculty of Education, Curriculum studies, University of Stellenbosch*

CONTACT NUMBER: *0811424283*

Dear Colleagues

My name is **SYLVIA HATUTALE** and I am master's student at the **University of Stellenbosch**. I would like to invite you to participate in a research project entitled: ***A Study of the Organizational Complexity of the Offering of Mathematics Education at a Namibian Tertiary Institution***

Please take some time to read the information presented here, which will explain the details of this project and contact me if you require further explanation or clarification of any aspect of the study. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the **Humanities Research Ethics Committee (HREC) at Stellenbosch University** and will be conducted according to accepted and applicable national and international ethical guidelines and principles.

The following questionnaire will require approximately 7 minutes to complete. There is no compensation for responding nor is there any known risk. In order to ensure that all information will remain confidential, please do not include your name. Copies of the project will be provided to the **University of Stellenbosch**.

If you choose to participate in this project, kindly answer all questions as honestly as possible. Participation is strictly voluntary and you may refuse to participate at any time.

Thank you for taking the time to assist me in my educational endeavours. The findings of this study will serve as a guiding instrument for educational policy-makers and all other relevant stakeholders for the development of enhanced policies and programmes with regards to Mathematics education in the Namibian tertiary institutions. If you would like a copy of this study, please send a request via the e-mail address provided below.

Completion and return of the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please contact me at the number or e-mail address listed below.

SYLVIA HATUTALE
CELL PHONE NUMBER: 0811424283
EMAIL ADDRESS: shatutale@unam.na
SUPERVISOR: Dr F GIERDIEN
EMAIL ADDRESS: faaiz@sun.ac.za

RIGHTS OF RESEARCH PARTICPANTS: You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.
You have right to receive a copy of the Information and Consent form.

If you are willing to participate in this study please sign the attached Declaration of Consent and *(hand it to the investigator)*

Yours sincerely

SYLVIA HATUTALE
Principal Investigator

DECLARATION BY PARTICIPANT

By signing below, I …….. agree to take part in a research study entitled……

……
……

and conducted by ……(Name of Researcher)

I declare that:

- I have read the attached information leaflet and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.
- All issues related to privacy and the confidentiality and use of the information I provide have been explained to my satisfaction.

Signed at (*place*) …….. on (*date*) …….. 2017.

……

Signature of participant

SIGNATURE OF INVESTIGATOR

I declare that I explained the information given in this document to _____ [*name of the participant] [H*e/she] was encouraged and given ample time to ask me any questions. This conversation was conducted in [*Afrikaans/*English/*Xhosa/*Other*] and [*no translator was used/this conversation was translated into* _____ by _____].

_____ _____
Signature of Investigator Date

APPENDIX F: ETHICAL CLERENCE LETTER

UNIVERSITEIT
STELLENBOSCH
UNIVERSITY

APPROVAL NOTICE
New Application

21 June 2017

Project number: SU-HSD-004286

Project title: A Study of the Organizational Complexity of the Offering of Mathematics Education at a Namibian Tertiary Institution

Dear Sylvia Hatutale

Your response to stipulations received on 14 June 2017 was reviewed by the REC: Humanities and has been approved.

Ethics approval period: 12 May 2017 – 11 May 2020

Please take note of the General Investigator Responsibilities attached to this letter. You may commence with your research after complying fully with these guidelines.

If the researcher deviates in any way from the proposal approved by the REC: Humanities, the researcher must notify the REC of these changes.

Please use your SU project number (SU-HSD-004286) on any documents or correspondence with the REC concerning your project.

Please note that the REC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

FOR CONTINUATION OF PROJECTS AFTER REC APPROVAL PERIOD

Please note that a progress report should be submitted to the Research Ethics Committee: Humanities before the approval period has expired if a continuation of ethics approval is required. The Committee will then consider the continuation of the project for a further year (if necessary)

If you have any questions or need further help, please contact the REC office at cgraham@sun.ac.za.

Sincerely,

Clarissa Graham

REC Coordinator: Research Ethics Committee: Human Research (Humanities)

National Health Research Ethics Committee (NHREC) registration number: REC-050411-032.
The Research Ethics Committee: Humanities complies with the SA National Health Act No.61 2003 as it pertains to health research. In addition, this committee abides by the ethical norms and principles for research established by the Declaration of Helsinki (2013) and the Department of Health Guidelines for Ethical Research: Principles Structures and Processes (2nd Ed.) 2015. Annually a number of projects may be selected randomly for an external audit.